SUPPLEMENT

TO THE

AMERICAN DISPENSATORY

KING & LLOYD

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C. E. Miles.

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BY

JOHN KING, M. D.,

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AND

JOHN U. LLOYD,

PROFESSOR OF CHEMISTRY AND PHARMACY IN THE ECLECTIC MEDICAL INSTITUTE OF CINCINNATI.

"No one point is more universally denied by the American people than the EXCLUSIVE RIGHT of one set of men to judge and have sole control in any thing. Persecution or proscription for opinion's sake is not tolerated in political or religious matters; and certainly should not be in those pertaining to medicine."

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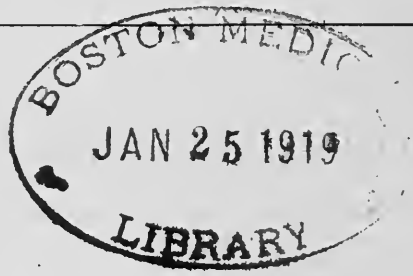

INTRODUCTORY REMARKS.

SINCE the last issue of our AMERICAN DISPENSATORY, many new articles have been announced to the medical profession as possessing superior and valuable therapeutical virtues; for various reasons, it has been deemed the better plan, at the present time, to present a description, history, etc., of these articles, in the form of a SUPPLEMENT. We have always been desirous of rendering this work as thorough and accurate as possible, but, heretofore, it has proven a very difficult task to procure the best working formulæ for many important preparations; and as it is highly imperative that in this respect, our work should stand second to none of similar character, we have entered into a copartnership with Professor JOHN U. LLOYD, a theoretical and practical chemist and pharmacist, well known to the pharmacists of this country. Into his hands we have placed the description of the various agents, their chemical history, and their pharmacy, and this arrangement will continue through subsequent editions. All matter furnished by him will be indicated by the signature "L." affixed, while the letter "K." will terminate our own.

In closing, we would renew our thanks to the several gentlemen who have kindly furnished us with new information and facts relative to medicinal agents, to the various authors from whom we have culled useful extracts, and especially would we acknowledge our high appreciation of the compliment bestowed upon this work by the National Eclectic Medical Association, at their Annual Convention held in Chicago, June, 1879, in giving their sanction to our DISPENSATORY, and accepting it as authority,—a compliment we shall endeavor to merit in the corrections and reliability of future editions.

JUNE, 1880. JOHN KING.

Professor JOHN KING, M. D.

Dear Sir:—According to our mutual understanding and agreement, I herewith place in your possession the descriptions, etc., of the medicinal agents, intended for the Supplement of the American Dispensatory. The botanical accounts of the several plants were furnished by my brother, Mr. C. G. LLOYD, under whose directions the pen-drawings of them were made, those of our indigenous plants being sketched from specimens in his herbarium. We take this opportunity to

acknowledge our indebtedness to the Librarian and assistants of the Public and of the Mercantile Libraries of this city, for their kindness and courtesy in placing at our disposal, the many works of said Institutions, pertaining to botany, chemistry, and pharmacy. We have thought it best to refer, either in the text or by foot-notes, to original or careful reprints (in English, when possible), of the important articles consulted, as much condensation was often necessary; and we are confident that in many instances the reader will desire to refer to the original treatises. In all cases it has been our aim, when possible, to give due credit to investigators.

The illustrations are original, excepting *Fig.* 9, and were executed by Mr. J. G. KNAPP; the desire, upon our part, being accuracy of delineation, and an expression true to Nature, rather than artistic effect, and, with this view, superfluous shading of leaves has been avoided.

The chemical and pharmaceutical processes given, are, unless otherwise stated, derived from personal experience in laboratory work and exchange of views with careful pharmacists,—due credit being given in such cases. The atomic weights are in accordance with Roscoe and Schorlemmer. The new notation is employed for chemical subjects. That our work may be acceptable to yourself, and be favorably received by the Medical and Pharmaceutical public, is the sincere desire of my brother, and of

Your Friend,

CINCINNATI, JUNE, 1880. J. U. LLOYD

Resolution passed by the National Eclectic Medical Association at their Annual Meeting in Cleveland, O., June 19th, 1879:

"*Resolved*, That this Association adopt THE AMERICAN DISPENSATORY as its STANDARD AUTHORITY."

ALEXANDER WILDER, M. D., SECRETARY.

SUPPLEMENT.

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PART I.

MATERIA MEDICA.

ACIDUM CHRYSOPHANICUM.

CHRYSOPHANIC ACID.

Formula, $C_{14}H_{10}O_4$; molecular weight, 241.42.

History.—Chrysophanic acid was discovered by Schrader, in 1819, in the Parmelia parietina, *Lin.*, a common wall lichen. He obtained it impure, and named it "resinous yellow of wall lichens." It was found in this lichen in 1843, and purified by Rochleder and Heldt, who gave it the name *chrysophanic acid*, from its yellow color. (*Ann. der Chem. und Pharm.* xlviii.)

Shortly after this, Schlossberger and Dopping decided the coloring matter obtained from rhubarb to be identical. This coloring matter had been known under the names of rheine, rheumine, rhabarberic acid, rhubarb yellow, etc., names doubtless given to impure forms of chrysophanic acid, *emodin*, especially, being intimately associated with it. Each of these substances are dissolved by benzine, the chrysophanic acid more freely.

According to E. Bourgoin, chrysophanic acid is present, in small amount, in senna leaves, and may be obtained by extracting crude cathartin, with ether... It is likewise found in yellow dock root, in small amount, and a prolific source of it is *araroba* (*Attfield*). When pure, it is in golden yellow needles, but considerable of that at present upon the market is in the form of a brownish powder, frequently retaining a strong odor of benzine, and totally unworthy the name of chrysophanic acid

Chrysophanic acid is volatile at high temperatures, is soluble to a slight extent in cold water, and a little more freely in hot. It dissolves readily in alcohol, ether, benzine, and glacial acetic acids, to which it

Sol

imparts a yellow color. Cold sulphuric acid dissolves it without decomposition, and with formation of a red color, from which solution water precipitates it in yellow flakes. It dissolves in alkaline solutions, with production of a beautiful red color, from which solution excess of acids precipitates it, and the liquid becomes decolorized. It has but little taste, and no odor. Its fusing point is between 323° and 324° F.

According to an analysis, made by Grabe and Liebermann, the composition is represented by the formula $C_{14}H_8O_4$, but more recent examinations make it $C_{15}H_{10}O_4$, (*Liebermann and Seidler,*) and $C_{14}H_{10}O_4$.

It must be remembered that chrysophanic acid is found most intimately associated with *emodin*, in rhubarb, and the presence of a small amount of this substance, or of other impurity, will readily account for the discrepancy in its composition.

Chrysophanic acid may be prepared from araroba, as follows: Mix in a flask one part of araroba, in powder, with eight parts of benzine, and bring to a boil; filter while hot, and when the liquid ceases to pass, return the undissolved matter to the flask, and add eight parts of benzine; boil, and filter, as before. Mix the filtrates, and evaporate to dryness. Dissolve the yellowish powder in sixteen parts of boiling alcohol, filter, and add to the filtrate thirty-two parts of cold distilled water. Allow this to stand for twenty-four hours, then separate the yellow precipitate, by means of a muslin strainer or filtering paper, and dry by exposure to the atmosphere.

FROM RHUBARB, chrysophanic acid may be obtained by exhausting the coarsely-ground root with water, evaporating the solution to dryness, extracting the residuum with boiling benzine, then evaporating the benzine, and, finally, purifying the residue by solution in hot alcohol, and precipitation with water, the same as stated above, in procuring it from araroba. Thus obtained, it contains *emodin*, but is pure enough for all practical purposes. The yield from rhubarb is small.—L.

Properties and Uses.—Chrysophanic acid has been chiefly employed as a local application in certain cutaneous affections, as, mentagra, eczema, tinea tonsurans, tinea circinata, psoriasis, acne rosacea, etc. It is generally applied in the form of an ointment, consisting of from ten to one hundred and twenty grains of the acid to one ounce of hot lard (360° F.), with which the acid must be thoroughly incorporated. The parts affected having been carefully washed, to remove fatty substance, and any existing scales (*squamæ*) having been softened and carefully removed, this ointment is to be well rubbed in upon the parts, two or three times a day. The strength of the ointment, and the number of applications per day, will depend considerably upon the amount of irritation occasioned, as it frequently gives rise to more or less irritation, or even inflammation, of the skin. When applied about the face and head, care should be taken to protect the eyes from its irritant action. Its use is often objected to by patients, on account not only of its staining the clothing and bed-clothes of a dull purple color, but likewise of its giving a more or less dark purplish tint to the skin, and a yellow color to the hair, with which it comes in contact. Mr. Balmano Squire, of London, Eng., to whom we are indebted for a knowledge of this agent, states that a careful use of bleaching powder will remove the stains from clothing; and liquor potassa, considerably diluted with water, will, it has been stated, discharge the discoloration of the skin and hair. While rubbing it upon the parts, the fingers may be protected from discoloration by wearing india rubber finger-tips, or by rubbing the stained parts with benzol.

Internally, but little is satisfactorily known as to the effects of chrysophanic acid. In small doses, from four to eight grains, it has occasioned vomiting, and in doses of from ten to twenty grains, both vomiting and purging. The time of action varies from four to twenty-four hours after it has been taken, and persists, in many cases, for two or three days. Liquor potassa, taken subsequently to the dose of the acid, appears to increase its activity.—K.

ACIDUM FORMICUM.

Formic Acid.

Formula, $H_2CO_2 = HCHO_2$; molecular weight, 45.89.

History.—This acid was first obtained by the distillation of ants, by Samuel Fisher (*Lavoisier*). Margraff examined it in 1749, and Ardwissan and Oehrn, of Leipsic, in 1777, fairly establishing its identity as a definite compound. However, in 1802, Fourcroy and Vauquelin endeavored to prove that it was a mixture of acetic and malic acids; but their opinions were refuted by Suersen and Gehlen. Berzelius, 1817, first attempted to determine its composition (*Annals of Philosophy*, ix, p. 107), by burning formiate of lead and chlorate of potassium in a glass tube, thus deciding that it contained oxygen, hydrogen, and carbon. Formic acid is found in certain caterpillars, and, doubtless, the "bombec acid" Lavoisier mentions as being obtained from silk-worm larva that are changing to chrysalis, was impure formic acid.

The "spirit of magnanimity," of Hoffman, was made by extracting red ants with spirits of wine. Recently, Mr. F. Will has shown that the fluid in the hairs of a species of caterpillar, which causes inflammation of the skin when handled, and the poisoning by the sting of some insects, is due to the formic acid present. It has also been demonstrated that the stinging hairs of the nettle, *Urtica urens* and *Urtica dioica*, contain this acid.

Formic acid is represented by the formula $HCHO_2$, thus a molecule contains the elements of water, H_2O, and carbonic oxide, CO. It is a strongly acid liquid, when concentrated capable of removing the cuticle. It does not char when heated, even with sulphuric acid, but in the latter case splits up into water and carbonic oxide. It dissolves freely in water and alcohol, and forms salts soluble in water. The salts of gold, platinum, mercury, and silver are reduced when heated with formic acid, and the metals deposited. Anhydrous formic acid crystalizes below 32° F., and, according to Attfield, boils at 221° F.

The experiments of Jardin show that the molecule of formic acid is incapable of furnishing carbon assimilable to even the simplest cellular organisms, and solutions of formiates remain perfectly clear many months.

Formic acid derived its name from the fact that it was obtained by distillation of red ants (*Formica rufa. Lin.*) Doebereiner discovered, in the early part of the present century, that it could be prepared artificially by the distillation of tartaric acid, water, sulphuric acid, and black oxide of manganese. At present, it is known that many organic bodies yield this acid, when distilled with black oxide of manganese and sulphuric acid, or with chlorinated lime, or with bichromate of potassium; but decidedly the best process we have tried is that based

upon the principle discovered by Berthelot,[1] that oxalic acid and glycerin will produce it, when heated together. Four parts each of oxalic acid and glycerin are to be mixed with one part of water, and a heat of 212° F. applied twelve or fifteen hours, or until the acid is decomposed. The residuum is now to be mixed in a still with its bulk of water, and distilled. It is then again mixed with the same quantity of water, and distilled, the operation being repeated, if the formic acid remains in amount to justify. The distillates are to be mixed, neutralized with carbonate of lead, then evaporated to dryness, and distilled with sulphuric acid, if desired pure; generally, however, the dilute acid is preferable.

A process was suggested by the Professors Rogers, in 1847, in which sugar was added to a solution of bichromate of potassium, and distilled, while sulphuric acid was slowly added. This requires great care, however, as, according to our experience, if the acid is allowed to enter too rapidly, the reaction becomes very violent, and may occasion disastrous effects. Besides, if distillation is conducted beyond a certain point, sulphurous acid contaminates the distillate.—L.

Properties and Uses.—Formic acid is rarely employed in medicine; it was, at one time, used externally as a local irritant, in sluggish capillary circulation, in certain painful affections, and in enfeebled or paralytic conditions of the limbs. The German Pharmacopœia has a "spirit of ants" (*Spiritus Formicarum*), used in chronic rheumatism, etc., in doses of from ten drops to a fluidrachm, also as an external rubefacient. It is made by macerating, for two days, one part of fresh red ants in one and a half parts, each, of alcohol and water, and then distilling off two parts. It forms a clear, acid fluid, yielding feathery crystals when mixed with $\frac{1}{20}$ part of subacetate of lead solution. Combined with ammonia (*formiate of ammonium*), the salt formed has been tried in chronic paralytic affections, and even in epilepsy, but without success; the dose is four, five, or six grains.—K.

ACIDUM HYDRIODICUM.

HYDRIODIC ACID.

Formula, HI; molecular weight, 127.53.

History.—This substance was discovered shortly after the detection of iodine. The process for its preparation, recommended in Dana's *Chemical Philosophy*, 1825, by mixing moistened iodine with phosphorus, is almost identical with that offered in some of the more recent works. A solution of the gas was officinal in the U. S. Pharm., 1860, being made from iodine, by decomposing sulphureted hydrogen with iodine in the presence of water, thus: $2H_2S + I_4 = 4HI + S_2$. This formula, according to Naumann,[2] can not yield an acid of greater specific gravity than 1.56.

It may be prepared in practice by mixing thirty grains of powdered iodine with five fluidounces of distilled water, and then passing sulphureted hydrogen through the mixture, until the iodine has disappeared; saturate this liquid with iodine, and again decolorize, with sulphureted

[1] Comptes Rendus, March, 1856. [2] Roscoe's Treatise on Chemistry, vol. 1, p. 160.

hydrogen. Repeat the operation until 480 grains of iodine have been used. The liquid now contains much precipitated sulphur and some free sulphureted hydrogen. Boil it gently, to drive off the latter impurity, then filter, and bring the filtrate to the measure of six fluid-ounces, by washing the filter with distilled water. If an attempt is made to pass the sulphureted hydrogen through water mixed with all of the iodine, the first action will be attended by a deposition of sulphur over the particles of iodine, thus protecting the enveloped particles from the action of the gas. This objection is overcome by taking advantage of the fact that iodine is soluble in a solution of hydriodic acid, and thus we successively dissolve the iodine, and then pass sulphureted hydrogen through each solution.

Hydriodic acid is a colorless gas, possessing strong acid properties, and a suffocating odor. It fumes when exposed to the atmosphere, and has the sp. gr. (air = 1) of 4.3737. Gay-Lussac demonstrated it to be composed of equal volumes of vapor of iodine and of hydrogen, by allowing it to remain in contact with mercury, whereby all of the iodine was absorbed, and the original volume reduced one-half. It is decomposed by heat, the iodine exhibiting itself as a violet vapor. Faraday discovered that at 32° F., under the pressure of four atmospheres, it condenses into a colorless liquid. At — 67° F. it freezes to a clear, colorless, transparent mass, resembling ice.

Solution of hydriodic acid is the hydriodic acid of commerce. It somewhat resembles hydrochloric acid, but is less stable. It can not be kept for any length of time, as, by exposure to the air, oxygen unites with the hydrogen, forming water, and the iodine is liberated, which, dissolving in the solution, gives to it a brownish red color. As soon as made, it should be securely sealed in small glass stoppered bottles, filled to the stopper, and placed in a cool situation until used.—L.

Properties and Uses.—Hydriodic acid has no efficient medicinal virtue, as far as known. The diluted acid has been referred to on page 39 of American Dispensatory.—K.

ACIDUM HYDROBROMICUM.

Hydrobromic Acid.

Formula, HBr; molecular weight, 80.75.

History.—This acid closely resembles hydriodic acid, and may be prepared in similar ways. Hydrogen and bromine do not unite at ordinary temperature, but the vapor of bromine will unite with hydrogen in a red-hot tube, containing finely-divided platinum; equal volumes combining to form hydrobromic acid (*hydrogen bromide*). It was obtained shortly after Balard discovered bromine (1826), but attracted little attention, excepting from experimental chemists, until within a few years past. It was generally prepared by gently warming a mixture of bromine, phosphorus, and water, or, bromine, phosphorus, water, and bromide of potassium; but either process is attended with danger. A very old process is by the reaction of sulphuric acid upon bromide of potassium, whereby hydrobromic acid and sulphate of potassium are produced; the process is defective, however, as formerly applied, from the fact that the distillate contained sulphurous acid and

free sulphuric acid; but recent investigations of Dr. Squibb have shown that this difficulty may be overcome, and, upon the authority of that careful experimenter, we present the following mode, as condensed from his process (*Am. Jour. Pharm.*, March, 1878): Mix seven parts of sulphuric acid with one part of water, and allow the mixture to cool.[1] Dissolve six parts of bromide of potassium, in six parts of distilled water, by means of heat, and pour into it the diluted sulphuric acid (observe the precautions given in note [1]); place the mixture aside, in a cool situation, for twenty-four hours, then decant the liquid into a vessel, and transfer the crystalline mass to a funnel stopped with cotton; pour slowly upon it two parts of cold water, and allow it to drain into the reserved solution in the vessel; transfer this liquid to a retort connected with a Liebig condenser, and carefully distil ten parts, or nearly to dryness; then add to the distillate two parts of distilled water. All the foregoing proportions are by weight, and the product will represent about 34 per cent. of hydrobromic acid.

The following table, by Dr. C. R. A. Wright,[2] will be of use in determining the percentage of hydrobromic acid in solutions of different specific gravity:

Percentage of Hydrobromic Acid.	Specific gravity, at 15° C. (59° F.).
5	1.038
10	1.077
15	1.117
20	1.159
25	1.204
30	1.252
35	1.305
40	1.365
45	1.435
50	1.515

According to A. Bertrand,[3] phosphoric acid may be substituted for sulphuric, when distilling with an alkaline bromide, thus overcoming the liability of the product to contain sulphurous acid. The composition of hydrobromic acid is represented by the formula HBr; the reaction which takes place when made from phosphorus, bromine, and water, being represented by the formula, $P + 5Br + 4H_2O = 5HBr + H_3PO_4$; that, when made from sulphuric acid and bromide of potassium, by the formula, $2KBr + H_2SO_4 = 2HBr + K_2SO_4$.

Hydrobromic acid is a colorless gas, fuming in the air, and irritating to the lungs, when inhaled. It condenses to a colorless liquid, at a temperature of —99° F., and solidifies, to an ice-like mass, at —125° F.[4] Its diffusive power is that of hydrochloric and hydriodic acids (*Graham*). Aqueous hydrobromic acid is colorless, and imparts an acid taste. If very weak, it becomes stronger, or, if very strong, weaker, by distillation, until the acid within the retort contains from 47 to 48 per cent. of hydrobromic acid. Hydrobromic acid evaporates completely, no residuum remaining; should sulphuric acid be present, a white precipitate

[1] We advise mixtures of sulphuric acid and water to be made by placing the water in an evaporating basin, and pouring the sulphuric acid, in a small stream, upon the side of the vessel, just above the surface of the water, stirring the mixture gently.—L.

[2] Chem. News, May 26th, 1871. [3] Compt. Rend., lxxxii, p. 96.

[4] Faraday, Phil. Trans., 1845.

will be formed, upon the addition of solution of chloride of barium. It is *incompatible* with alkalies and alkaline carbonates, with which it forms "bromides;" likewise, with plumbic, argentic, and mercurous salts, in solution, with which it forms precipitates of the corresponding bromides.—L.

Properties and Uses.—Hydrobromic acid can not be administered internally, unless considerably diluted, on account of its powerfully corrosive qualities. Drs. D. C. Wade and J. M. Fothergill have found it efficacious in the headache that frequently follows the administration of quinine, as well as of ferruginous preparations. If given after the doses of the latter agents, it prevents the sensations of fullness and pain, that are apt to be occasioned by them, especially with those laboring under cerebral anemia. Dr. Fothergill prepared this acid by dissolving 1,297 grains of bromide of potassium in one pint of water, and then adding 1,584¼ grains of tartaric acid; bitartrate of potassium is precipitated, and the hydrobromic acid remains, in a clear, colorless fluid, the dose of which varies from half a fluidrachm to a fluidrachm. The diluted acid, as thus made, is an impure preparation, and preference should be given to the acid produced according to the method of Dr. Squibb, diluting it as required.

This acid has, also, been found useful in all forms of nervous excitability, sometimes acting more efficaciously when in combination with quinine, which it readily dissolves; thus, the above formula of Dr. Fothergill will dissolve 480 grains of sulphate of quinia, forming a solution of sulphate of quinia in hydrobromic acid, which may be given in the same doses as stated for that diluted acid. In nervous exhaustion from excessive use of tea, or alcoholic drinks, in hysterias from ovarian derangement, in sleeplessness, in gastric irritability, in menorrhagia, and in the vomiting of pregnancy, it has been administered with success. In association with quinine, and digitalis, it has been found of service in enfeebled and excited conditions of the heart; with spirit of chloroform and syrup of squills, it forms a pleasant and efficacious mixture, in all coughs. When considerable cerebral excitement exists from physical or mental overwork, or, during febrile affections, its internal administration will prove highly serviceable. Dr. E. Woakes, and others, have derived great benefit from its use, in cases of tinnitus aurium, resulting from the use of quinine, and from congestion of the parts, especially, in those instances in which the tinnitus was of a pulsating, or knocking, character; doses of fifteen minims of the acid, in water, were repeated every four hours. This acid appears to possess the therapeutical virtues common to the bromides of potassium, and of sodium, although less persistent in its action; and, unlike them, it possesses the advantage of not occasioning the troublesome acneiform eruption, so often following their administration. Epilepsy, so frequently improved under the use of the alkaline bromides, is rendered worse by the administration of hydrobromic acid. Hydrobromate of quinia has been found a much better form, in solution, than the sulphate, for subcutaneous injection.—K.

ACIDUM SALICYLICUM.

Salicylic Acid.

Formula, $H_2C_7H_4O_3$; molecular weight, 137.67.

History.—In the year 1839, an article, from the pen of M. Pira, stated

that by heating salicin, with mixtures of bichromate of potassium and sulphuric acid, an oily product was obtained, which he named *hydruret of salicyle* (since known as salicylous acid). When this substance was heated with caustic potash, the mass dissolved in water, and then treated with excess of muriatic acid, a white substance crystallized, which Pira named *salicylic acid.* Soon afterward, Cahours and Gerhard obtained it, by decomposing wintergreen oil.

Kolbe and Lautermann[1] succeeded in preparing salicylic acid, by passing carbonic acid gas through carbolic acid, at the same time, adding fragments of metallic sodium. The residuum was dissolved in water, and excess of hydrochloric acid added, when impure salicylic acid separated. Afterward, Kolbe found that by preparing dry carbolate of sodium, and heating it, to the temperature of 100° C., gradually increased to 220° C. (not to exceed 250° C.), while, at the same time, a constant stream of carbonic acid gas is kept passing through the retort, phenol will distil over, and salicylate of sodium remain in the retort, thus: $2(C_6H_5ONa) + CO_2 = C_6H_4ONa.\ CO_2Na + C_6H_5OH$.

This preparation was very impure, however, and it was not until after the year 1875 that, from this source, white salicylic acid became an article of commerce. Rautert, 1875, found that pure salicylic acid would distil with a current of steam, thus enabling chemists to easily purify Kolbe's dark-colored, or yellow, preparation, and Dr. Squibb recommends this process in practice. At present, the bulk of the salicylic acid, found in commerce, is prepared from carbolic acid, by Kolbe's process. Salicylic acid is, likewise, found in the leaves of wintergreen (*Gaultheria procumbens*), and in allied plants, as a methyl–salicylic ether. Cahours and Gerhard discovered it in the former, about 1843. Cahours also obtained it while distilling a mixture of indigo and hydrate of potassium with sulphuric acid; and Delandes, by a somewhat similar action, upon coumarin. Distilled *oil* of *meadow sweet* (Spiræa ulmaria) readily yields it, as this oil is, mainly, salicylous acid ($C_7H_6O_2$). Prof. E. S. Wayne obtained salicylic acid, from an oil, distilled from buchu leaves, and the writer (1877) from an oil, obtained by distillation from senega root. (This oil proved to be identical, in character, with oil of wintergreen.)

Salicylic acid separates from concentrated solutions, when rapidly cooled, in the form of small, crystalline tufts of minute acicular crystals. It is inodorous, but the crude salicylic acid, in course of preparation, from wintergreen oil, possesses, from the presence of foreign matters, the peculiar odor of fresh willow bark, an odor familiar to those who have visited willow plantations, and have become impressed with the exhalation from freshly-stripped willows. When pure, this acid imparts, at first, a sweetish taste, which quickly becomes acrid and disagreeable. It sublimes, when gradually heated, but, according to Biel, after sublimation, it has a tendency to spontaneously decompose into carbolic acid and carbonic acid gas. When heated rapidly, to the temperature of 430° F., this decomposition ensues at once.

Salicylic acid is soluble in alcohol and ether, when cold, more readily soluble when boiling. It dissolves, to a slight extent, in cold, but more freely in boiling water, from which latter solution it crystallizes upon cooling. It unites with alkalies, to form salts, the sodium salicylate being considerably employed in medicine. With neutral ferric salts, solution of salicylic acid strikes a rich, red color, and, on this account, it should

[1] Ann. de Chem. et Pharm., cxiii.

not be allowed to come in contact with iron vessels, etc., which are certain to discolor it. The dust of salicylic acid is irritating, if inhaled, exciting coughing and a sensation of suffocation.

In making solutions of salicylic acid, in water, phosphates or acetates of the alkalies are often added, as salicylic acid is very soluble in these solutions. It is stated that a compound of borax with salicylic acid, Na (BO) $2C_7H_5O_3$. may be formed, and, in practice, it is customary for physicians to add borax, when desiring to make an aqueous solution of the acid.

To prepare salicylic acid, dissolve, in an evaporating dish, two and one-half parts of white hydrate of potassium, by means of a similar amount of distilled water, and raise the temperature of the solution to 180° F.; then add, with constant stirring, three parts of oil of wintergreen (*Gaultheria procumbens*). When effervescence ceases, pour the solution into a mixture, composed of hydrochloric acid, four parts and distilled water, ten parts; stir well, and allow the mixture to remain in a cool place for twenty-four hours; then pour it upon a muslin strainer, drain the crystalline magma, redissolve it in boiling water, and crystallize by cooling; or, dissolve the precipitate in alcohol, and then reprecipitate, by the addition of water. Pure wintergreen oil must be employed in this process, because, if adulterated, with sassafras oil, as is often the case, much trouble will be experienced in purifying the acid.

The salicylic acid of commerce is often very impure. Carbolic acid, the most objectionable impurity to be expected in that made from this acid, may be detected by nearly neutralizing the suspected acid with soda solution, and then agitating the liquid with ether. Upon evaporating the ethereal liquid, carbolic acid, if present, may be recognized, by its odor (*Allen*).

CRESOTIC ACID, $C_8H_8O_3$—, is a homologue of salicylic acid, and the properties of commercial salicylic acid are said to be often considerably modified by its presence. It is more soluble in boiling water, but, likewise, produces the violet reaction with ferric chloride.

The foregoing impurities are only to be found in salicylic acid artificially prepared from carbolic acid. That made from wintergreen oil may contain chloride of potassium, recognized by remaining insoluble, when the acid is washed with excess of alcohol. For medicinal use, the acid from wintergreen is often preferred by physicians.—L.

Properties and Uses.—The therapeutical virtues of salicylic acid are not satisfactorily determined; while many physicians highly extol it, as possessing certain valuable properties, as many others, on the other hand, emphatically deny this, and attribute the results following its employment, to other causes. According to MM. Chirone and Petrucci, animals subjected to the daily ingestion of this acid, rapidly emaciate, and lose much of their weight. With frogs, and mammifers, it always diminishes the number of pulsations; in large doses, it elevates the temperature of the body, and diminishes the number of respirations; in small doses, it lowers the temperature. According to others, its use is apt to occasion, more or less deafness, tinnitus, pain in the forehead, manual tremors, and accelerated respiration; and very large doses induce intense cephalalgia, tremors, excessive debility, hurried respiration, some lesion of the kidneys, and tingling sensations in the extremities, and, in some instances, rapid collapse, and cerebral symptoms, varying from those resembling cinchonism to nearly acute delirium. H. Kohler states that it depresses the respiratory activity, and may,

even, occasion death by asphyxia. Auger observes that its prolonged use, in large doses, especially with women, is very apt to occasion nausea, vomiting, pyrosis, diarrhea, angina, tinnitus, and even deafness, redness of the face, and slight congestion, and that, with inebriates, it may determine a furious delirium. These results, he adds, may sometimes be prevented, or mitigated, by administering it in milk, or in unleavened bread with a cup of milk. Pye Smith has observed that the urine of a patient who has been taking salicylic acid, gave the characteristic saccharine reaction, with the copper test; while Muller and others have found its soda salt to temporarily, or permanently, as the case may be, cause the diabetic sugar to completely disappear. M. Gubler observes that, when the kidneys are normal, the use of salicylic acid occasions diuresis, while, on the contrary, the urine is in diminished amount, and even albumen is present, in, more or less, considerable quantity, when there is a lesion of these organs. M. Bucquoy cites a case in which abortion, at the sixth month, followed the administration of this acid; and he also inquires whether the rapid deaths of certain patients, treated with this acid, and especially when the doses were large, may not be due to uremia, occasioned by its use. One or two writers have stated that the osseous system is affected by its use, and I am aware of several instances in which caries of the teeth occurred after a treatment with salicylic acid; but whether due to this acid is a question yet to be determined. Many of the serious symptoms following its employment have been attributed to an impure preparation; yet, as such symptoms have been observed, it behooves the medical practitioner, not only to be certain that he is employing the pure acid, but, likewise, to be careful in its administration, and to closely watch its effects, that he may be the better prepared to promptly remove any undesirable symptoms that may arise therefrom. The irritating action of this acid, upon the mucous membrane of the mouth, pharynx, œsophagus, etc., is said to be due to impurities; but the pure acid will occasion a dryness of the mucous membrane, followed by slight burning and increased saliva.

By various investigators, it has been claimed that salicylic acid is an antiseptic and germicide; by others, that it is a disinfectant, a deodorizer, an astringent, and an antipyretic. Kohler and some others consider it an antiseptic and germicide only when locally applied, because, when taken internally, it becomes united with an alkali, loses its antiseptic action, and produces effects similar to those following the ingestion of sodium salicylate. MM. See, Laborde, and others, state that the good effects following its internal administration are entirely due to its action as an analgesiant, and deny that it has any antiseptic, antipyretic, or antiperiodic action, when thus employed. Prideaux speaks highly of its efficacy in small-pox, when in combination with ammonia and soda; his formula is a mixture of carbonate of ammonium, carbonate of sodium, each five grains, salicylic acid, twenty grains, water, one fluidounce; the dose is one-half, or the whole, of this solution, given every four or six hours. It is pleasant to the taste, unirritating to the intestinal canal, and modifies the disease so as to arrest it in its second and third stages, and also to prevent pitting, after recovery, in consequence of the absence of pus formation. *Braithwaite's Retrospect*, January, 1878, p. 188, from *Med. Exam.* Letzerich states that upon the addition of salicylic acid to the diphtheritic organisms in the urine of children affected with severe diphtheria, and which consisted of bacteria, micrococci, and protoplasmic masses, the bacteria were destroyed, and the

corpuscles of the plasmic substance became dim, presented a double margin, and, apparently contained air-bubbles. He considers it a powerful anti-diphtheritic agent, and has successfully treated several cases of the disease, using a solution of the acid as a gargle, and applying the pulverized acid over the affected surface. Others, again, have derived no benefit whatever from its employment in diphtheria. But it is useless to continue these discordant statements, from which it will readily be seen that even its acknowledged partisans are not agreed as to its therapeutical virtues, and that our knowledge concerning its value is still very imperfect; and until more satisfactory information concerning its action shall be had, it will be advisable to employ it with great care and prudence, to closely watch its effects, and to at once suspend its administration whenever any unexpected symptoms appear, or when any doubt exists as to its influences upon the system, or any of its organs. Salicylic acid, and its salts, appear in the urine in from twenty to thirty minutes after its ingestion, and may be known by the violet color produced when a solution of perchloride of iron has been added to this fluid, thus revealing the presence of salicyluric acid; also, by its deviating to the left of the plane of polarization, from the presence of salicin.

Salicylic acid, as well as its salts, as salicylate of sodium, of calcium, of lithium, of ammonium, of quinia, have, undoubtedly, been found of great value in acute articular rheumatism, rapidly reducing the temperature and the pulsations, and mitigating the pain, thus tending to prevent serious complications, allowing the excretory organs to eliminate any nocuous substance, and lessening the intensity and duration of the disease. As with all remedies, failures may occur, chiefly owing to the treatment with the acid not having been commenced until after the existence of complications, or from want of perseverance in following up the treatment, as, from the rapid elimination of the acid from the system, it requires to be frequently and persistently administered, in order to be of any avail. The acid may be given in doses of from ten to sixty grains, repeated two or three times a day; or, still better, in doses of five to ten grains, repeated every hour or two. It has, likewise, been used in gout, to lessen pain, and favor the elimination of the sodic biurate present in the blood in excess, but it should not be administered to gouty patients whose urine contains albumen; though Dr. S. J. Sharkey and some others doubt whether the medicine has any thing to do with the presence of albumen in the urine, as this substance is encountered in the urine of rheumatic patients with high temperature; still, it is better to observe caution until the matter is settled definitely. In acute diseases, intermittents, etc., it has failed as frequently as it has proved successful; and, indeed, doubts exist as to whether the successful results can be attributed to its action. It has been proclaimed useful in aphthæ, thrush, lumbago, neuralgia, diabetes, hectic fever, etc., but further investigations are necessary before any reliance can be placed upon its use in these affections. As the rule, the administration of one of its salts is preferable to the pure acid, especially its sodium salt, on account of its more perfect solubility, its milder action, and its more agreeable taste.

When salicylic acid, or any of its salts, is found to disagree with the stomach, occasioning uneasiness, nausea, or other unpleasant feelings, these may be prevented or mitigated by the administration of an aromatic tincture or infusion, with each dose.

As a local application, a spray of solution of salicylic acid has been

found serviceable in ozena, fetid bronchitis, aphthæ, pulmonary gangrene, and other maladies attended with offensive odor. In diarrhea and dysentery, also in leucorrhea, used in injection, it has proven useful, especially in removing fetor; in these cases it should be used in solution considerably diluted, as a strong solution is apt to be quite irritating.

In diseases due to, or attended with minute organizations (fungi), as, diphtheria, parasitic cutaneous maladies, hay fever, coryza, etc., its application in solution, or in dry powder, has been productive of benefit; in ulcers, suppurating wounds, and gangrene, it forms a very useful dressing, though, probably, inferior to thymol, or carbolic acid.

The following formula have been given for the administration and application of salicylic acid; the solutions, it will be observed, are salicylates of the alkalies entering into them. 1. Salicylic acid 30 grains, citrate of ammonium 40 to 45 grains, water 4 fluidounces; mix. Or, salicylic acid 30 grains, citrate of ammonium 15 grains, rum or brandy ½ a fluidounce, distilled water 2½ fluidounces; mix. The dose is one or two tablespoonfuls. (*A. Casson*). 2. Salicylic acid 180 grains, carbonate of ammonium 90 grains, water 6 fluidounces; mix. Dose, a tablespoonful every three hours. (*J. A. E. Stuart*). 3. Salicylic acid 60 grains, borax 30 grains, glycerin 1½ fluidounces. Mix the acid and borax with half an ounce of the glycerin, and heat until solution is effected, then add the balance of the glycerin. For internal and local application. 4. Salicylic acid 30 to 60 grains, white wax 60 grains, paraffin 120 grains, almond oil 2 drachms; mix, melt, and rub up in a heated mortar. Spread on strips of muslin or fine linen. It is an excellent antiseptic application, and also useful in eczema, rodent ulcer, etc. (*Lister*). 5. Salicylic acid 10 grains, borax 6 grains, water 6 fluidounces; mix, heat, and while the solution is hot, saturate clean cotton with it, and allow it to dry. This cotton forms a valuable dressing for surgical purposes. 6. Salicylic acid 10 drachms, pure olive oil 16 ounces; mix, heat, and rub up in a heated mortar. Lint or cotton saturated with this oily solution, forms a very satisfactory application to burns, scalds, eczematous affections, etc.—K.

ADANSONIA DIGITATA.

Nat. Ord.—Malvaceæ. *Tribe.*—Bombaceæ. The bark of Adansonia Digitata, *Linn.*

Common Names.—Baobab, Monkey-bread tree, Sour-gourd tree.

ILLUSTRATIONS.—*Bot. Mag.*, Plates 2791 and 2792.

Description.—Adansonia digitata is a large tree of the western coast of Africa and Egypt, sometimes attaining huge dimensions, being often twenty-five feet in diameter, although the height is not nearly so great in proportion. It was formerly supposed to attain a great age, and Adanson, a French botanist, in whose honor the tree was named, estimated a tree on the islands of Cape de Verd to be over five thousand years old, a point disputed by Benthan, who asserts that A. digitata is of rapid growth and comparatively short lived. It is the Baobab tree of travelers, and also known as Monkey-bread, Cream of Tartar tree, and Sour-gourd tree. The local name is Gowik Chentz or Churee Chentz.

The *leaves* are digitate, and consist of five acute elliptical leaflets, re-

sembling the leaves of our common buckeye. The *flowers* are very large and suspended on long peduncles; the calyx not having the peculiar involucre at its base which characterizes many genera of the Malvaceæ. The *style* is long, exserted from the staminal column, and bears a ten-rayed stigma. The fruit, which is nearly a foot long, is divided into ten cells filled with an agreeably acid pulp in which the seed are imbedded.

History.—The baobab tree belongs to the section Bombaceæ, of the natural order Malvaceæ, by De Candolle considered sufficiently distinct to form a separate natural order, which differs from Malveæ (the typical form of Malvaceæ) in having the *calyx* imbricated in the bud, and the staminiferous tube divided into five bundles at the apex; whereas the stamens of the Malveæ are perfectly monadelphous.

The bark is the part employed, and, together with the leaves and flowers of the tree, contains much mucilaginous matter. When fresh it is about five-eighths of an inch in thickness, brown, with a rough epidermis. A section shows the structure to consist of a mixture of pitted wood cells devoid of general arrangement. The cut surface of a tranverse section is mottled yellowish green, and reddish brown, uniting with the woody fiber of the trunk.

The decoction of the bark decomposes rapidly, owing to the mucilaginous material present; however, this may be prevented by the addition of alcohol, or, a small quantity of sulphuric acid. By treatment with alcohol, subsequently evaporating, then digesting with litharge, and extracting with ether; upon evaporating the ether, white needles of an extremely bitter taste are obtained, named *Adansonin*. These are fusible, dissolve in six parts of cold, and three of boiling ether, are soluble in alcohol, and but slightly so in water; they are not precipitated from their solution by alkalies, and chloride of iron imparts a greenish tinge to the alcoholic solution. Their formula is $C_{48}H_{36}O_{33}$ (*Wittstein*)—L.

Properties and Uses.—According to M. Duchassaing, the bark of this tree possesses febrifuge properties, and although devoid of bitterness, may be beneficially substituted for cinchona; since its introduction into our markets, no satisfactory report has been made of its virtues in this respect. The juice of the fruit is stated to be employed in its native country as a remedy in putrid and pestilential fevers; and a decoction of the nut, in dysentery. A decoction of the bark is of a reddish color, somewhat resembling that of decoction of cinchona. *Comp. Rend.*, xxvi, 1848, and *Jour. de Pharm.*, June, 1845.—K.

ÆTHER METHYLICUS.

Methyl Ether.

Formula $(CH_3)_2O$; molecular weight, 45.90.

Preparation.—This substance is produced by abstracting the elements of water from methyl alcohol: $2CH_4O - H_2O = C_2H_6O$. It is prepared by heating a mixture of 1.3 parts of pure methylic alcohol and 2 parts of sulphuric acid, in a flask, gradually raising the temperature to 140° C. (284° F). The gas is washed by passing it through solution of caustic soda[1]

History—Methyl ether, known also as methyl oxide or methoxylmethane, is a colorless gas, with an ethereal odor. It burns with a pale flame.

[1]Chem. News, vol. 30.

Its specific gravity is 1.617, air being the standard, or 23, hydrogen being the standard of unity. One great objection to it as a popular remedial agent is the fact that it is gaseous at ordinary temperatures. Water dissolves thirty-three times its volume. Alcohol and methyl alcohol dissolve it more freely, while sulphuric acid will dissolve six hundred times its volume, with increase of temperature. In the latter case, the gas is freely liberated upon the addition of water.—L.

Properties and Uses.—This gas, taken up to saturation, by concentrated ethylic ether, at a temperature of 32° F., forms the anesthetic fluid of Dr. B. W. Richardson, of England—methyl-ethylic ether. As it is very volatile and highly inflammable, it should be at once placed into well-secured bottles, and kept in the cold. According to Dr. Richardson, it is a rapid and perfectly safe anesthetic, and more closely approximates what a true agent of this kind should be than any other yet presented to the profession. A drachm or two inhaled, effects anesthesia quickly. It simply destroys sensibility, without interfering with will, consciousness, or muscular power, and without occasioning spasm, syncope, asphyxia, or any excitation of the nerve centers.—*Lancet*, April 2, 1870. In consequence, however, of the instability of this preparation, and its by no means agreeable odor, it has not come into general use as an anesthetic.—K.

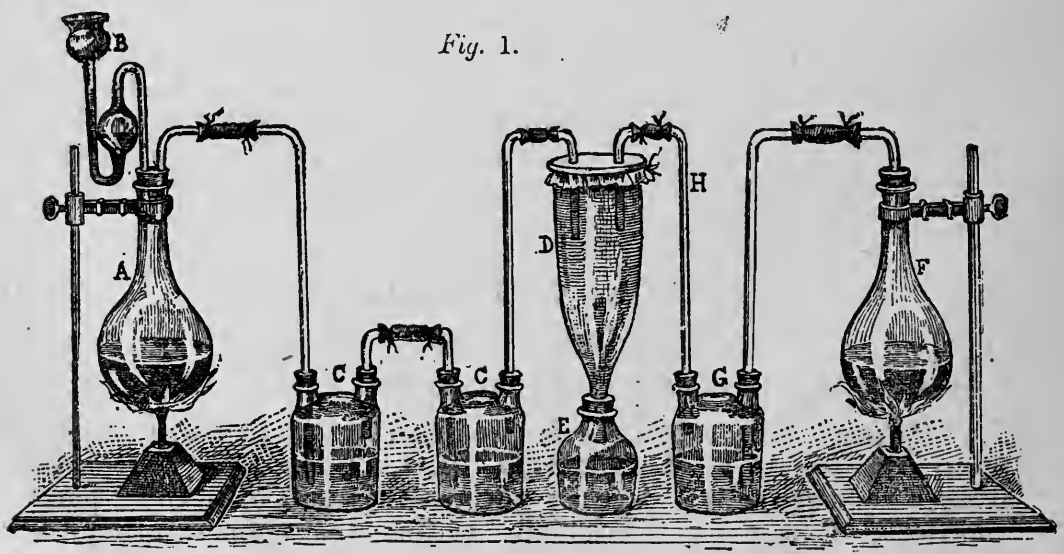
ÆTHYLENI BICHLORIDUM.

BICHLORIDE OF ETHYLENE.

Formula, $C_2H_4Cl_2$; molecular weight, 98.68.

Preparation.—In 1795 four associated Dutch chemists discovered that when one measure of alcohol was mixed with three of sulphuric acid, and heat applied, a gas was evolved, named by them *olefiant gas* (now known as ethylene or ethene), from its property of forming an oil-like liquid with chlorine. This liquid, for many years recognized under the name *Dutch liquid*, is ethene chloride, or bichloride of ethylene.

Fig. 1.



To prepare it, connect a thirty-two ounce chemical flask, A (Fig. 1), furnished with a safety-funnel, B, by means of glass tubes, with two eight ounce wash bottles, C, C, one of which contains four fluidounces of sulphuric acid, the other a like amount of solution of caustic potash. The second is connected, by means of a glass tube, with a glass percolator,

D, covered with a sheet of rubber, through which the tube protrudes. The exit of the percolator is loosely inserted into the mouth of the bottle, E, which contains four fluidounces of distilled water.

Connect the sixteen ounce chemical flask, F, with an eight ounce wash bottle, G, which contains four fluidounces of distilled water, and is connected with the percolator, D, by means of the glass tube, H, protruding through the rubber cover. Into the flask, A, place a mixture of alcohol two fluidounces, and sulphuric acid twelve fluidounces, and into the flask, F, place one ounce of black oxide of manganese and six fluidounces of muriatic acid, previously diluted with four fluidounces of water. Apply heat now to the flask, A, by means of a spirit-lamp, and, when the gas begins to flow, heat the flask, F, in like manner, and thus pass both gases (ethene and chlorine) simultaneously into the percolator, upon the sides of which an oily substance will form and trickle through the exit into, and settle to the bottom of the distilled water. This is impure bichloride of ethylene, and must be agitated with water, then with sulphuric acid, and finally distilled. As the reaction progresses, the contents of the flask, A, may be slowly replenished, through the safety funnel, B, with a mixture of equal parts of sulphuric acid and alcohol. Finally, when the flow of gas ceases, or the reaction becomes irregular, suspend the operation, agitate the impure liquid collected in the bottle, E, with distilled water, then with sulphuric acid, and lastly distil it.

Bichloride of ethylene may also be prepared by the process of Limpricht (1856), who made it by passing olefiant gas through a retort half filled with a mixture of two parts of black oxide of manganese, three parts of common salt, four parts water, and five of sulphuric acid. The retort being gently heated at first with a single red-hot coal.

History.—Bichloride of ethylene is a mobile liquid, colorless, inflammable, and possessed of a fragrant, ethereal odor, and a sweetish taste. It is very soluble in alcohol and ether, and only slightly so in water. Its specific gravity is 1.271 at 0° C. (32° F.), and its boiling point 85° C. (185° F). Neither sulphuric acid nor hydrate of potassium affects it. Bichloride of ethyl must not be confounded with solution of ethyl chloride (C_2H_5Cl), or the so-called *hydrochloric ether*,[1] which is made by passing dry hydrochloric acid gas into cold alcohol, and purifying the product by distilling the contents of the retort, washing the gas with a little tepid water, and condensing in a receiver surrounded with ice and salt. Ethyl chloride, or chlorethane, is a volatile, highly inflammable liquid, boiling at 12°.5 C. (54°.5 F.), and is, consequently, gaseous at ordinary temperatures. Water dissolves 10 per cent, and alcohol, at 21° C. dissolves 48.3 per cent. of its weight.—L.

Properties and Uses.—Bichloride of ethylene has been proposed as a much safer anesthetic than chloroform, but it has not come into use on account of the excessive irritation of the throat and fauces attending its inhalation. It is occasionally used locally, in spray or otherwise, to allay the sufferings in certain maladies, from pain, as in rheumatism, lumbago, neuralgia, etc.

Ethyl chloride, or hydrochloric ether, is occasionally employed in combination with an equal volume of alcohol, as a substitute for the compound spirit of ether, in doses of from five to twenty drops diluted with water, wine, etc.—K.

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[1] *Chloric ether* is a name once applied to mixtures of alcohol and from five to eighteen per cent. of chloroform. Afterward, it was prepared by distilling chlorinated lime with water, and an excess of alcohol. It is seldom mentioned at the present day, and has properly become almost obsolete.—L.

AILANTHUS GLANDULOSA.

Nat. Ord.—Simarubeæ. *Tribe.*—Simarubeæ. The inner bark of the tree and root.

Common Names.—Tree of Heaven, Ailanto.

Description.—Ailanthus is a large tree with blunt, clumsy branches, which give to it an odd appearance after the leaves have fallen. The *leaves* are oddly-pinnate, each consisting of from ten to twenty pair of leaflets and a terminal one. The *leaflets* are about two inches long, ovate, smooth, acute, and have a few blunt glandular teeth at the base (hence, the specific name, glandulosa). The *flowers* are small, green, and collected in large terminal panicles. They are polygamous, or generally diœcious. The calyx consists of five united sepals. The petals are five, small, green, and longer than the sepals. The stamens are ten in the male flowers, but fewer in the female. The pistil is surrounded at the base by a disk, and consists of from three to five, one-ovuled, free carpels, with united styles. The *fruit* is a flat, membranous samara, bearing a seed in the middle, and somewhat resembling the fruit of the ash.

A. glandulosa is a native of China, where it is known as "Ailanto," of which the German name "Gotterbaum" is said to be a translation. "Tree of Heaven" is the name by which the tree is vulgarly known in this country. It is in common cultivation as a shade tree throughout Europe, and the United States, and has become naturalized in many localities. It was formerly classified in the natural order, *Rutaceæ*, but is now placed in that of Simarubeæ. It is allied to the genera, Quassia and Simaruba, from which it differs in the fruit being a samara.

History.—This tree is of rapid growth, and easily accommodates itself to any soil, thus being well adapted to cultivation; but is is objectionable on account of a fetid odor which is mostly exhaled from the sterile flowers.

The genus Ailanthus consists of three species, all large trees, and natives of Asia, none of which, however, are cultivated in this country excepting the *A. glandulosa.* Another species, the *A. imberiflora* is found in Australia.

The recent root is white, hard, and woody. It is covered with a white fibrous bark, the outer part of which is gritty, brittle, and yellowish, over which is a grey epidermis. The epidermis of the limbs and growing sprouts is smooth, shiny and brown, or yellowish. It is studded with numerous little eruptions which increase in size with age, until when old, the bark is rough. Beneath this a green coloring matter is found in young specimens, while the bark next to the wood is white. In growing shoots the woody matter is thin, surrounding a yellowish brown pith, which latter decreases in proportion with the growth of the shrub. Both the root and shrub have an acid reaction when fresh, and exhale a disagreeable odor when broken. For medicinal purposes, the bark of the small bushes and roots is to be preferred. Professor Hetet, of Toulon, noticed the tree in the *Journal de Pharmacie* in 1859, at which time it attracted attention in France, in consequence of its leaves having been suggested as food for a species of silk worm. The bark of the tree was experimented with, and attracted some attention at that time as an emeto-cathartic and anthelmintic, but it seems to have quickly fallen into disuse.

In the year 1875, Dr. H. L. True published an article in the *E. M. Journal*, which revived, among the Eclectic practitioners of this country,

an interest in the therapeutical uses of the bark, since which numerous communications to medical journals have created a demand for it, and which is supplied in abundance in most localities.

About twenty years ago M. Payen analyzed the bark and detected lignin, chlorophylle, yellow coloring matter, pectin, bitter substance, aromatic resin, traces of volatile oil, nitrogenous matter, and some salts. Afterward, (1861) Mr. Alonzo Lilly, Jr., made an examination, the result of which differs considerably from the above, as, according to this gentleman, the constituents are, starch, tannin, albumen, gum, sugar, oleo-resin, and a trace of volatile oil, potash, phosphoric acid, sulphuric acid, iron, lime, and magnesia.

The bark has a nauseating bitter taste, and, when recent, a sickening odor. Both the fresh and the carefully dried bark impart a deep green color to alcohol, probably due to chlorophylle, the color gradually changing to yellowish brown by age, the action of light accelerating the change. According to our experience, the bark contains a resinous substance, which, with the volatile oil, is extracted by alcohol, which agent will perfectly exhaust all the characteristic properties of either the fresh or dry Ailanthus.

According to the experiments of M. Hetet, the purgative property resides in the resin, while the volatile oil gives rise to the prostrating and other ill effects produced on those exposed to the vapors of the evaporating extract; and, probably, to a similar hydrocarbon, may be ascribed the sickening sensation experienced by many persons when inhaling the atmosphere vitiated by the emanations from an Ailanthus tree in blossom. Mr. Hetet's statement, that the resin is purgative has been disputed, some even asserting that the resin is inert.—L.

Properties and Uses—The bark of Ailanthus has been employed by Roberts, Dugat, and others, both in the recent and dried state, as a remedy for dysentery and diarrhea, also in gonorrhea, leucorrhea, prolapsus ani, etc. Fifty grammes of the root-bark are infused for a short time in seventy-five grammes of hot water, then strained, and when cold, administered in teaspoonful doses, night and morning. To lessen the disagreeable impression following its use, as well as to mask its bitterness, it may be administered in sweetened orange-flower water, or in some other aromatic. Professor Hetet, of the Toulon Naval School, states in *Jour. de Chim. Med.*, December, 1859, that the leaves and bark, in powder, or in the form of an aqueous, or of an alcoholic extract, will remove tape-worm; but he found its action upon patients to be very disagreeable and nauseating, somewhat like that occasioned by tobacco upon young smokers. Dupuis has also found it useful as a tænifuge. In the September No. of the *Eclectic Medical Journal* for 1875, page 393, Dr. H. L. True, of Ohio, states that from his observations the bark is not poisonous, but produces vomiting, great relaxation, and a death-like sickness, which symptoms gradually pass away. He has successfully employed a tincture of the root-bark in cardiac palpitation, obstinate singultus, asthma, and epilepsy. The dose of the tincture is from five to sixty drops, repeated as often as required, or, from two to four times a day. He considers the presence of these trees in malarial districts to have a strong action, similar to that of the Eucalyptus, in antagonizing those influences that produce intermittents.—K.

AKAZGA.

Ikaja.—M'Boundou. The Root-Bark.

History.—According to MM. Pecholier and Saint-Pierre, of France, this is a shrub of the family of Apocynaceæ, which, as with some other plants of the same family (*Nerium Oleander, Inee, etc.*), is a violent poison. M. Touchard, in his thesis, 1864, entitled, "*the river Gabon and its maladies,*" states that it is a shrub attaining the height of about two metres (6½ feet), with a tap-root, of which the bark only is employed. The *leaves* are opposite, acuminate, oblong, and from four inches to a foot in length; their nervures presenting an arrangement somewhat similar to those of the Melastomaceæ.

The bark of this shrub is intensely bitter, and feebly aromatic, and contains, according to Professor T. R. Fraser, of Edinburgh, a crystallizable alkaloid freely soluble in ether, chloroform, benzole, and bisulphide of carbon, which forms salts with acids, and which he has named *Akazgia.*

Properties and Uses.—According to Pecholier and Saint-Pierre, the bark of this shrub is employed in infusion among the Africans on the Gabon as an ordeal liquid, under the name of M'Boundou. The bark is macerated, and the infusion given to the accused to drink, followed by certain proceedings; and if the accused can successfully pass the ordeal, he is deemed innocent of the charge against him. Its effect is to determine tetanic convulsions, with rapid death; sometimes a profuse urination occurs, and the person gradually returns to health and life. From experiments on frogs, a dog, and rabbits, these gentlemen have concluded that the Boundou contains a poisonous principle, soluble in water and in alcohol, and which exerts an action upon the sensitive nervous system analogous to that caused by nux vomica. Administered by the stomach, or used endermically, this poison increases the number of inspirations and cardiac pulsations, succeeded by a great diminution of these movements, at the same time it causes an exaggeration of sensibility, followed by tetanic convulsions, and, finally, insensibility, paralysis, and death. Its action upon the motor nervous system is only secondary, and it does not affect the contractility of the muscular system. It is not a poison to the heart which, on the contrary, continues to pulsate for a long time after death. (*Montpelier Medical*). This agent has not yet been introduced into our therapeutics.—K.

ALKANNA.

Nat. Ord.—Borraginaceæ. *Tribe.*—Borrageæ, D. C. The root of Alkanna tinctoria, *Tausch.* *Syn.*—Anchusa tinctoria, *Linn.* Lithospermum tinctoria.

Common Names.—Alkanet, Dyer's Bugloss.

ILLUSTRATION.—*Artus' Hand Atlas*, Vol. II., page 438.

Description.—The plant is a weak, hairy herb, about a foot high, with alternate, oblong, entire, bicuspid *leaves.* The *flowers* are small, and disposed in terminal racemes, usually in pairs, which unroll as the flowers expand. The *calyx* is five-lobed, and the *corollas* funnel-shaped, with a red tube about the length of the calyx-lobes, and a blue, five-parted

limb. The *fruit* consists of four distinct nutlets, which are contracted, and not hollowed, at the base.

History.—The Alkanet plant is indigenous to, and cultivated in, the Southern part of Europe. The roots of the cultivated plants are not so rich in the red coloring matter as those grown in their native soil. The genus Alkanna is closely related to Anchusa and Lithospermum, and the roots of all three genera yield red coloring matters. Alkanet is also known as *Dyer's Bugloss.*

Alkanet root contains a red coloring matter—*Anchusin* or *Alkanet-red.* To obtain it (*Wittstein*) the root is exhausted with water to remove gum and foreign coloring matters, then dried, ground, and percolated with alcohol. The alcoholic tincture is acidulated with hydrochloric acid, distilled, and evaporated to the consistence of a soft extract; this is exhausted with ether, water added, and, after agitation, the lower liquid separated. The ethereal solution is again washed with water, decanted, and evaporated. Anchusin is dark, red-brown, brittle, neutral, volatile, subliming in violet-red vapors. It is insoluble in water, soluble in alcohol, more soluble in ether and oils. Sulphuric acid dissolves it with amethyst color; solution of alkalies, with blue.. The other constituents of the plant are unimportant.

Alkanet root, as obtained in this market, is often worm-eaten, and of very inferior quality. It appears as fragments, mixed with entire roots from six to twelve inches in length. They are dark purple externally, lighter within, pliable and spongy. This root is largely employed by manufacturers of pomades, hair oils, ointments, etc., for the purpose of coloring them. For these purposes, a solution of the *Alkanet-red* is made by covering the crushed root with castor-oil, macerating and straining; the deep red coloring matter is thus obtained in solution, and this solution is added to the oil or pomade until the desired shade is produced.—L.

Properties and Uses.—This root is rarely, if ever, employed therapeutically, though stated to possess emollient properties. Its chief use among pharmacists is for coloring certain articles.—K.

ALETRIS FARINOSA.

Nat. Ord.—Hæmodoraceæ. The rhizome of Aletris farinosa, *Linn.*, gathered after the plant has flowered.

ILLUSTRATIONS.—*Strong's American Flora* (exclusive of root), page 65, and our Plate I.

(See *Am. Disp.*, 8th ed., p. 78.)

In consequence of the confusion that has existed in determining this plant and its root, from those of the Chamælirium, and owing to some errors in the description of Aletris, as given in *American Dispensatory*, it has been deemed best to introduce, at this place, a more correct account of it, in order to obviate any perplexity in future.—K. & L.

Description.—Aletris is a small herb found in most parts of the United States. The common name is *Star Grass*, but the term *False Unicorn* is sometimes used. The name *Unicorn Root* is more properly applied to Chamælirium (Helonias). Aletris is also known as *Blazing Star.*

The *leaves* are all radical and grass-like, from one-fourth to half an inch wide and from two to four inches long. They are smooth, entire,

acute, of a firm texture, and have from six to ten parallel and quite prominent veins. The *flowering stem* is erect, from two to three feet high, and arises from the center of the cluster of root leaves. It has no stem-leaves, but at intervals of about two inches, there are very small linear scales which may readily escape detection without a close examination. The *stems* are round and striate near the base, but angular above. The *flowers* are perfect and in slender, terminal, simple racemes. They are on short pedicels, with small bracts at the base. The *perianth* is cylindrical, urn-shaped, white, with a yellowish tinge at the apex; wrinkled, rough and mealy outside, and six-cleft at the summit. The *stamens* are six, small and included. The *ovary* is ovate, and tapers to a slender style, which is trifid at the apex. The *fruit* is a dry, many-seeded, acute pod, opening by three valves.

History.—The commercial drug, under this name, as found upon the market, is generally the rhizome of Chamælirium. (See page 63.) Strange as it may seem under these circumstances, the two roots have no resemblance, are utterly unlike, and their appearance forbids admixture. We can not recall a single instance where Aletris farinosa was *adulterated* with Chamælirium, and yet so universal has the substitution of the last become, that Professor King, in describing the root of Aletris (*Am. Disp.*, 8th ed., p. 78), has given a description of that of Chamælirium, and *Strong's American Flora* figures the top of Aletris with the rhizome of Chamælirium. In this connection, we invite attention to our exact engraving of the Aletris plant and root (plate I), and, as a comparison, invite attention to the engraving of Chamælirium (Plate VI, opposite to page 64).

When dry, the root of Aletris farinosa is from one-half to one inch in length, seldom longer. It is surrounded and completely hidden by an intricate mass of fibers, remains of radical leaves and partly decayed matter. The recent growth of yearly fibers are white, and from two to six, or even ten, inches in length. In texture, they are made up of a hard, durable, brown, woody center, over which are several layers of white, tissue-like material, that peel off by age and decay. Thus we find the lower portion of the dry rhizome of Aletris farinosa covered by a mass consisting of dead, brown, woody fibers of former years, from which the paper-like envelope has separated, together with white, recent rootlets from which the white epidermis is still scaling; while intermixed, are the chaff-like remains of the epidermis, in various stages of decomposition.

The radical leaves spring directly from the upper part of the growing end of the creeping rhizome. They contain numerous hard, round, woody fibers running lengthwise with the leaf, and from year to year, as the succulent portions of the leaves decay, the fibers remain and hold the fragments of mealy leaf-matter, and thus the upper, as well as lower, portion of the primary root is perfectly concealed from view.

The dried root proper is about one-fourth of an inch in diameter just beneath the leaves, and tapers from this point to nearly an eighth of an inch; very often the extreme end turns downward, and usually terminates abruptly. The surface is rough, scaly, and thickly covered with root fibers below, and leaf scars and leaf fibers above. Internally, it is soft, spongy, white or slightly straw-colored, the central portion being less firm than the outer. It is odorless, acrid to the taste, *not bitter.* Chamælirium, on the contrary, is very bitter.

Physicians should insure the identity of Aletris when purchasing. There is no excuse for confusion, as the two plants (Aletris and Cham-

PLATE I.

ALETRIS FARINOSA.

ælirium) are entirely different in appearance, the roots do not resemble each other, and are, to the taste, utterly unlike; and while Chamælirium has a peculiar and characteristic odor, the Aletris is odorless.—L.

Properties and Uses.—See *American Dispensatory*, 8th ed., p. 79. This root and its preparations are almost entirely employed in dyspeptic conditions; while, in the abnormal conditions of the female reproductive organs the Chamælirium is used.

ALSTONIA CONSTRICTA.

Nat. Ord.—Apocynaceæ. *Sub Ord.*—Euapocyneæ. The bark of Alstonia Constricta, (*F. Muell.*)

Common Names.—Native Quinine of Australia, Australian Fever Bark.

ILLUSTRATIONS.—Our Plate II, Fig. *A. a.*

History.—The genus *Alstonia* comprises about twelve species, seven of them being given in Bentham's Flora of Australia. They are milk bearing shrubs or trees, with large, entire, generally whorled leaves, and terminal cymes of white flowers.

ALSTONIA CONSTRICTA (*F. Muell*), is a lactescent, smooth tree, found growing only in Australia, and has large, opposite, entire oblong *leaves* about four inches long, borne on slender leaf-stalks. The *flowers* are small, white, numerous, and disposed in corymbose cymes. The *calyx* is deeply five-parted and has ovate acute lobes. The *corolla* has a bell-shaped tube, about twice the length of the calyx, and five equal spreading lobes. The *stamens* are five, distinct and included. The *pistil* consists of two carpels, with a single style. The *fruit* consists of a pair of slender, smooth pods, from three to eight inches in length, and containing numerous, flat, pubescent seeds, the upper margins of which are fringed with long hairs.

History.—The *bark* is used in Australia as an antiperiodic. As found in commerce it is in pieces varying in length from six inches to two feet, from half an inch to three inches in thickness, and from two to four inches in width. That from the young trees or branches is often curled, like cinnamon bark, until the edges meet, or even overlap. The accurate description given by Mr. Charles Mohr in the *Am. Journ. Pharm.*, August, 1879, is as follows: "The bark occurs in semicircular pieces of various length, about 4 inches wide and from $1\frac{1}{2}$ to 2 inches and over in thickness, according to the more or less exuberant development of the corky layers. The rough outer bark is furrowed by more or less broad and deep longitudinal fissures, presenting in the cross section a margin correspondingly deeply indented by irregular more or less wide and deep sinuosities. The exposed surface of the bark is of a dingy gray-brown, and of an ochre color where fresh layers of cork are exposed. This outer bark, forming far the largest part, shows in the cross section a mottled yellow and brownish color, resulting from somewhat irregular concentric layers of a clear ochry-yellow, alternating with bands of a deeper tint. It is of spongy texture, and friable. The middle and inner layers about a quarter of an inch in thickness, are compact and homogeneous in the cross sections of a yellow color, and under the lens appearing punctate from the darker faces of the bast-bundles; of a fibrous structure, hard and tough, and on the inner side serrated by longitudinal ridges, caused by the impressions of the bast-

bundles upon the cambial layer. The powder of the bark is of a dingy yellow, and possesses a faint not unpleasant odor, and a lasting purely bitter taste. The active principles are contained chiefly in the middle and inner bark." (See Plate II, Fig. *a*).

This bark is of a comparatively recent introduction, having been shown for the first time in this country, at the Centennial Exposition in the Australian department, where it was asserted, by its exhibitors, to be a remedy for malarial fevers. A Cincinnati gentleman having had his attention strongly attracted towards these assertions, procured a specimen of the bark, and, after investigation, having found it to possess therapeutical virtues, he ordered a supply from Australia, intending to introduce it as a proprietary medicine. Professor J. M. Scudder, of Cincinnati, persuaded him, however, to give up his intention, and allow it to come before the medical profession under its true name, *Alstonia constricta*, the positive identification of which, Mr. Charles Mohr effected through specimens sent to Sir. Joseph Hooker.

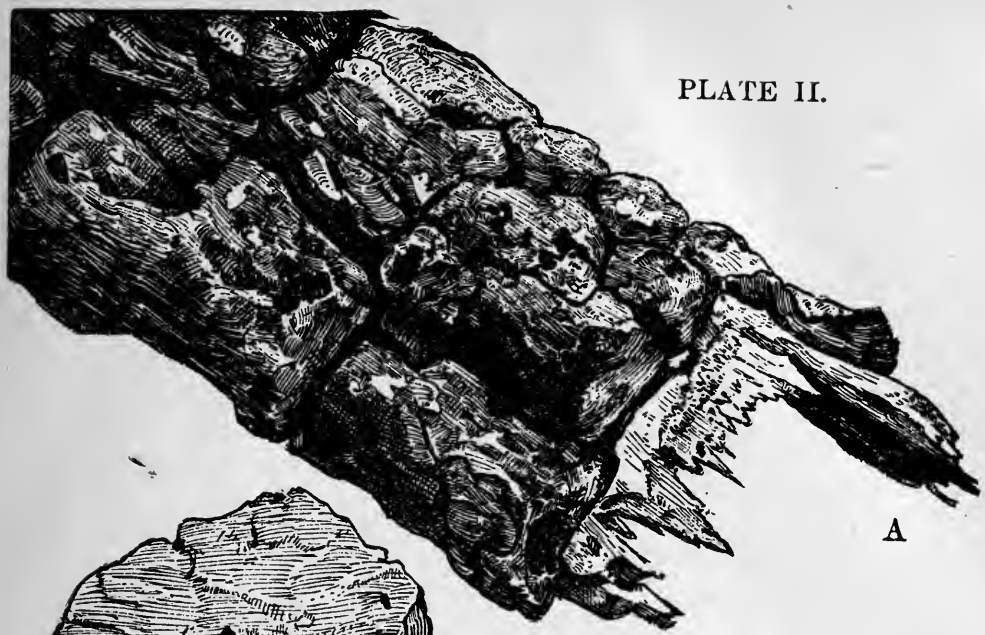
The chemical constituents have been investigated by several parties, but the results do not agree. *Alstonin* is the name given in Wittstein's Organic Constituents of Plants for an orange yellow, amorphous, alkaloid, isolated by Mueller and Rummel. Mohr (1879), found a substance agreeing with that of M. and R. in all respects, and announced the probable presence of another proximate constituent; but want of material prevented a thorough examination. Oberlin and Schlagdenhaussen (1879)[1] report an analysis of the bark, and the isolation of two alkaloids, one, *Alstonin* in crystalline tufts, bitter, colorless, soluble in alcohol, chloroform, benzine; insoluble in cold, but somewhat in boiling water; soluble in nitric, hydrochloric, and sulphuric, acids without color, but which neutralizes acids, changes red litmus paper to blue, and the acid solutions of which produce fluorescent (blue) liquids. The other, "*alstonicine*," is amorphous, and is obtained from the mother liquor after the production of *alstonin*. It somewhat resembles alstonin, but is not as soluble in boiling water, gives a red crimson color with nitric acid, and greenish-brown with sulphuric and muriatic, and the acid solutions are not fluorescent. All reports agree, however, that these proximate principles exist in very small amount. There is certainly a very bitter substance, resinous or otherwise, which is obtained by tincturing the bark with alcohol. Doubtless either the bark in substance or the tincture or fluid extract will be the medicinal preparations employed; the most effectual being prepared from the *inner* bark.

Von Mueller appears to have been the first person who made known the febrifuge properties of this bark, in 1870, in an address before the Industrial Museum of Melbourne; in 1874, in a published statement relative to certain select plants, he again remarks that the bark of *A. constricta* is aromatic, bitter, and regarded as valuable in ague; also as a general tonic. It was subsequently referred to, as an antiperiodic, in 1876, by Dr. A. Cathcart, of South Wales. Its introduction to the Materia Medica of this country justly belongs to Professor J. M. Scudder, M. D., of Cincinnati.—L.

Properties and Uses.—The inner bark of Alstonia constricta is said to possess marked antiperiodic properties, while the outer bark is stated to have been efficacious in curing certain forms of rheumatism. Further trials are needed, however, before it can be ranked as a substitute for quinia, or other of the cinchona alkaloids. And yet, as far as heard

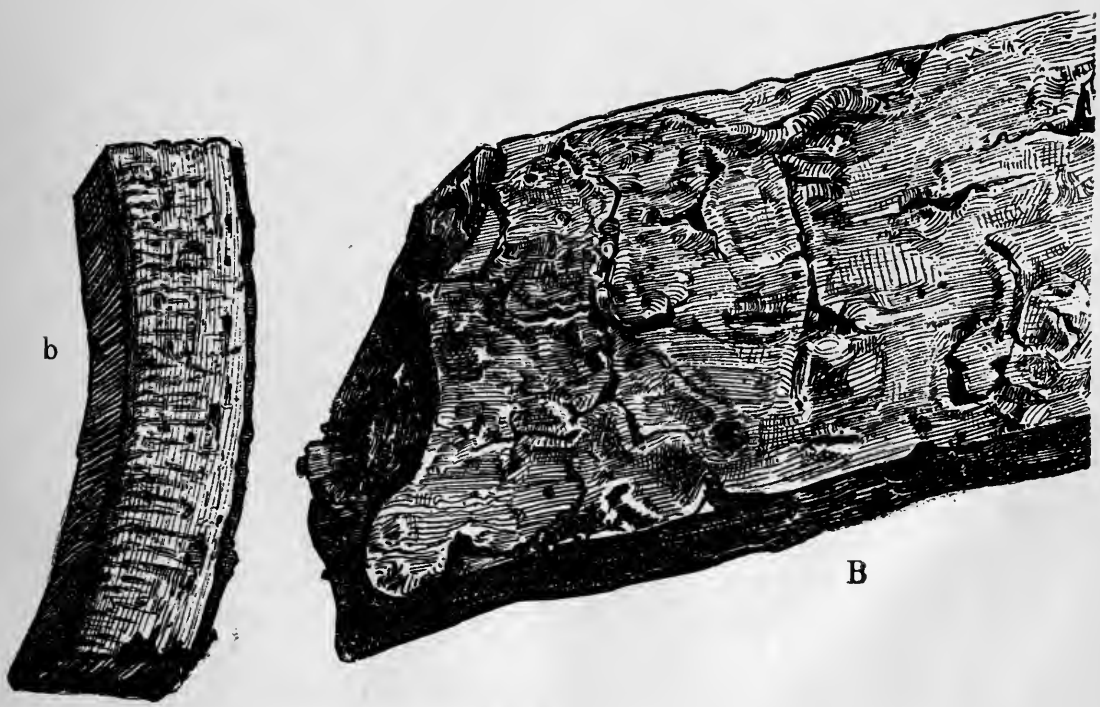
[1] *Pharm. Jour. and Trans.*, June, 1879, from "*Jour. de Pharm. et de Chimie.*"

PLATE II.



A

a



b

B

ALSTONIA CONSTRICTA AND A. SCHOLARIS.

from, it has proved as efficient as quinia in intermittents. The writer has used the bark in several cases with prompt and decided success; four of these cases were small children. The inner bark was given to the patients, in a dose of from four to eight grains, an hour or two before the expected chill, repeating the dose two or three times, each time anterior to the anticipated chill. Three doses were usually required; in one case, only one dose was given, and in two others four doses were taken before the chills disappeared. The most marked influence was in an obstinate case, tertian, invariably attended during the attacks with gastric pain and irritability, and neuralgic pains in the superior extremities; the first dose afforded much relief, and since the third dose the patient has been entirely free from any symptoms of the malady, and has, for the first time in several years, passed an autumnal season without any chills, while neighbors were suffering more or less severely from them. Professor Locke has used it successfully in chronic intermittent, but thinks it not so efficacious in the acute forms. Professor J. M. Scudder has also had considerable success with it. Dr. Kalb, of Henry, Ill., has cured six cases of fever and ague with it; Dr. E. Ray, of Paris, Ky., reports the successful use of it in intermittents where quinia had failed. Dr. J. G. Sutton, of Genoa, O., Dr. C. Cramp, of Camden, Ind., and many others, have reported favorably as regards its antiperiodic virtues. According to Dr. R. E. Kuntze, of New York city, this bark possesses slightly narcotic, cerebro-stimulant, antiperiodic, febrifuge, and tonic properties; he has used it with success in several cases of intermittent fever, though, from its peculiar effects in certain cases, he is rather inclined to consider its use contra-indicated in "patients of a delicate and highly nervous organization." Among the patients with whom it has acted favorably, it not only checks the ague, but appears also to prevent its return, for the season, at least. The bark is very bitter, and produces different effects with different parties; among these effects may be named a persistent disagreeable taste, more or less nausea or a sense of disgust, dizziness, pain in the forehead and occiput, tinnitus, weight in the epigastrium, etc. With many, the only appreciable symptoms noticed, are the unpleasant taste left in the mouth and fauces, and the prompt disappearance of the chills. The dose of the bark, which should be well masticated, is from two to eight grains; but the more desirable form for administration and efficacy appears to be the tincture, the dose of which will vary from ten to sixty minims every hour or two, and which should be given on the days of the attack, commencing several hours before the expected chill. This is certainly an agent that should be thoroughly tested by the profession.—K.

ALSTONIA SCHOLARIS.

Nat. Ord.—Apocynaceæ. *Sub. Ord.*—Euapocyneæ. The bark of Alstonia Scholaris, *R. Br.*

Common Name.—Dita Bark.

Illustrations.—*Bentley and Trimen, Med. Plants*, P. 173, and our Plate II, Fig. *B. b.*

Description.—Alstonia scholaris, *R. Br.*, *Dita Bark*, is found throughout Tropical Eastern Asia and the Malayan Archipelago, (*Bentham*). It is a large tree with smooth entire thick *leaves* disposed in whorls. The

flowers resemble those of *A. constricta*, but differ in having corolla tubes about three times as long as the calyx, and shorter pubescent lobes. The pods are slender and over a foot long. *Don* says it is a native of the East Indies and the Moluccas; the bark, met with in commerce, comes from the Phillippine and neighboring islands, and is the portion used in medicine. The local name of the bark is *satween.* As a remedial agent *dita* is old, having been mentioned, it is said, by Rheede (1678), and Rumphius (1741).

History.—Dita bark (Plate II, Fig. *B. b.*), is about half an inch thick, and is found in market in irregular sizes from one to two inches wide, and three to six inches long. Externally it is of a mottled pinkish or brownish and white color, rather smooth, but marked by shallow fissures which are raised upon the edges and scarcely extend through the corky layer. The cork, a very thin layer, represented by the dark edge of the section *b* of our engraving, is brown. Internally, the color of the bark is light, slightly striated with yellowish layers or grains. In texture, it is granular and brittle, resembling wild cherry bark from old trees. The taste is slightly bitter, free from astringency, not unpleasant, and may be compared to the after taste of wild cherry bark, and in like manner the bark is gritty between the teeth.

According to Husemann, Scharlee in 1863, published an article on the preparation of an alkaloid which he named *Alstonin.* Grupp found in it about two per cent. of a substance which possessed febrifuge powers, and he named it "Ditain." It was prepared, according to Hildwein, in a manner similar to that used in making quinine; it is not an alkaloid bnt a mixture of substances as was verified by Gorup-Besanez who found it to contain a crystallizable substance possessing the properties of an alkaloid. Gobst and Hesse (1875), separated the true alkaloid, *ditamin*, from the bark, as a white amorphous powder, slightly bitter, soluble in ether, chloroform, benzol, and alcohol, being alkaline in reaction from the latter solution. It forms soluble salts, with dilute acids, which are very bitter; it dissolves with a reddish color, in sulphuric acid; and a yellow in nitric acid, turning dark green at first when heated, then orange-red, with evolution of fumes of the same color. It was obtained only in about 0.02 per cent. of the bark operated upon, and on this account, can never be expected to come into general use as a febrifuge. In addition, they found oxalate of lime, fatty acid, and crystallizable acid and likewise identified several fatty resinous substances, naming them:

Echicaoutschin	$(C_{25}H_{40}O_2)$
Echicerin	$(C_{30}H_{48}O_2)$
Echitin	$(C_{32}H_{52}O_2)$
Echitein	$(C_{42}H_{70}O_2)$
Echiretin	$(C_{35}H_{56}O_2)$

These substances closely resemble resins obtained from other sources. Doubtless, the bark, if employed in medicine, will be either used in substance or in the form of tincture or fluid extract, as the proximate principles can not become of much commercial importance.—L.

Properties and Uses.—Dita bark has been efficaciously employed in malarial fever; it does not, however, appear to be as prompt nor as active in its influence as the Alstonia constricta bark, requiring to be used in somewhat larger doses. Its alkaloid may prove more efficient should it ever become more largely and less expensively prepared.—K.

ALUMINII SULPHAS.

SULPHATE OF ALUMINUM.

Formula, $Al_2 3SO_4$; molecular weight, 342.06.

Crystallized, $Al_2 3SO_4 18H_2O$; molecular weight, 665.34.

Description.—This salt is prepared on a large scale from China clay, by roasting the clay and then digesting it in dilute sulphuric acid, the solution being permitted to stand until clear. It is then decanted from the insoluble matter (silica and undecomposed alumina) and evaporated until it thickens upon cooling. As thus prepared, it is often known as *concentrated alum*, and is used mainly as a mordant, and also to give weight to paper. The composition of anhydrous aluminum sulphate is represented by $Al_2 3 (SO_4)$. The hydrated salt, $Al_2 3 (SO_4) + 18H_2O$, is officinal in the *United States Pharmacopœia*, the process of which forms precipitated trihydrate of aluminum (AlH_3O_3, or $Al_2(OH)_6$), by the decomposition of sulphate of aluminum and ammonium, by means of sodium carbonate; sulphates of sodium and ammonium remaining in solution, and carbonic acid gas being evolved. It is intended that the precipitated aluminum hydrate be freed from soluble sulphates by washing, then united with sulphuric acid, and the solution evaporated to dryness, whereby crystallized aluminum sulphate, $Al_2(SO_4)_3+18H_2O$, is obtained. Practically, it will be found that the water in which the salts (carbonate of sodium and the alum) are dissolved by the *U. S. P.* is insufficient, inasmuch as the solution of the alum may be troublesome to make, and when obtained, the two solutions are so concentrated that the hydrate is deposited in lumps, difficult, if not impossible, to free from contaminating sulphates by the subsequent process intended for washing.

The formula of the *U. S. P.* has been referred to here, because we think the process an objectionable one, and would present the following as an improvement upon it (See *New Remedies*, August, 1879, p. 237):

Dissolve four troy ounces of alum, and the same amount of carbonate of sodium, each separately, in four pints of hot distilled water; pour the alum solution, in a small stream with constant stirring, into the soda solution in a capacious porcelain dish, and bring the mixture to a fair boil. Then cool, and pour the mixture upon a muslin strainer; when drained, return the precipitate to the dish, and mix thoroughly with a gallon of water, then strain, as before. Repeat the operation; then almost dissolve the gelatinous precipitate by means of diluted sulphuric acid,[1] and filter the solution; evaporate it upon a water bath, with stirring, until a dry salt remains.

History.—Sulphate of aluminum, prepared as above, is a white powder. It may contain traces of the sulphates of sodium and ammonium, which, however, is not a serious objection, unless in larger amount than is possible with the process we have given. It crystallizes with difficulty, forming thin, six-sided crystals. The taste is sweetish and astringent. According to Berzelius, it is soluble in two parts of cold water. It melts on heating, in its water of crystallization, and then swells, like alum, forming the anhydrous sulphate, $Al_2(SO_4)_3$. At a red heat, it decomposes, the residue being alumina.—L.

Properties and Uses.—Sulphate of aluminum is employed as a local application in cases in which a stimulating, astringent, or antiseptic action

[1]In case there is an *excess* of acid, it will be impossible to dry the salt; therefore we advise the use of not more than one troy ounce of sulphuric acid, thus insuring complete saturation. The excess of aluminum hydrate will remain upon the filter.—L.

is required. From four to six pounds of the salt dissolved in a gallon of water, and the solution injected into the cadaver, in the usual way, will preserve it, in the dissecting-room, for from eighteen days to two or three months, according to the temperature of the weather (*Gannal*). A solution consisting of from 75 to 240 grains of this salt in 3 fluidounces of water, has been found exceedingly useful as a topical application to old ulcers, and in leucorrhea with offensive discharge. A saturated solution, and more especially when in combination with zinc oxide, has been employed as a stimulant or gentle caustic in tonsillary enlargements, polypus of the nose, affections of the uterine cervix, mother's mark, obstinate ulcers, chronic catarrh, and in other chronic diseased conditions of mucous tissues; it may be applied every day in form of spray, or with a camel's-hair pencil. A "benzinated solution of aluminum," diluted with from 25 to 64 times its weight of water, forms an excellent application in chronic nasal discharges, in ulcerated conditions of the os uteri, as well as in offensive vaginal discharges; it may be used by injection, or in the form of spray. This benzinated solution is prepared by dissolving four ounces of aluminum sulphate in eight fluidounces of water, then adding recently formed gelatinous alumina to saturation, and finally adding eight drachms of coarsely powdered benzoin,—the best article of benzoin, that in the form of whitish tears, being used for this purpose. This solution is kept at a temperature of from 148° to 152° F., for six or seven hours, being stirred from time to time, until, when filtered, it has attained the specific gravity 1.26. It is then set aside in a cool place for six or seven days, until alum crystals are precipitated, and the solution has acquired a balsamic odor, and taste, with astringency.—K.

AMMONII NITRAS.

NITRATE OF AMMONIUM.

Formula, NH_4NO_3; molecular weight, 79.90.

History.—Nitrate of ammonium has been known for a great many years.[1] It is readily prepared by adding ammonia, or ammonium carbonate, to dilute nitric acid, and, when the mixture becomes neutral, evaporating it slowly to crystallization. As found in the market, for the purpose of making nitrogen monoxide, it is in the form of a white fibrous mass, in which case it is prepared by quick boiling until a portion will become solid when placed upon a cold porcelain slab. The mass is then allowed to cool, broken into fragments, and preserved, in a cool place. As thus prepared, it is known by the name, *fused nitrate of ammonium.* This salt was of little interest until the introduction of nitrous oxide, when a demand for it was created. It crystallizes in rhombic prisms, possesses a strongly saline taste, is very soluble in boiling water, and in half its weight of cold, and also in alcohol of sp. gr. 0.880. When ammonium nitrate and manganese dioxide in equal amounts are heated together, at the temperature of from 360° to 400° F., pure nitrogen is evolved, but above 420° F., teroxide of nitrogen and oxygen accompany.[2]

Dry ammoniacal gas is absorbed in large amount when passed over

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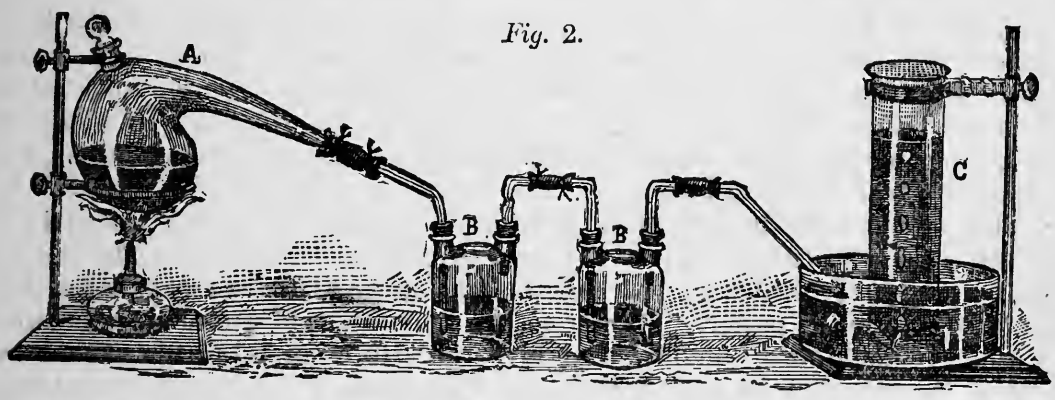
[1] Discovered by Glauber, and known as *nitrum flammens.*

[2] *Chem. News,* Vol. xxxv.

ammonium nitrate, attended by liquefaction of the salt. At 0° C. (32° F.) half the weight of the salt will be condensed.[1] When quickly raised to a high temperature, dry nitrate of ammonium decomposes into nitrogen, water, and nitric oxide, whereas, when gently heated it forms water, and *nitrogen monoxide*[2] (N_2O), or nitrous oxide, a gas discovered by Priestley, in 1776. It remained of interest to the experimental chemist until after Davy, in 1800,[3] discovered its wonderful action when inhaled. Then it became a curiosity, and as such under the name *laughing gas*, remained until a recent period. At present it is in extensive use throughout civilized countries for the purpose of producing temporary insensibility. It is best to prepare it from fused nitrate of ammonium, as at a certain temperature this substance splits up into water and nitrous oxide gas; $NH_4NO_3 = N_2O + 2H_2O$. If the nitrate of ammonium be free from chloride, no special precautions are necessary further than washing the gas with warm water; but if, as is often the case, the ammonium nitrate is impure, precautions must be taken to separate the impurities. For this purpose the following process is recommended:

Fig. 2.



Into the retort A (*Fig.* 2) introduce fused nitrate of ammonium to one-third its capacity. Connect this, by means of glass tubes, with two wash bottles B B. The first bottle half filled with solution of sulphate of iron, the second half filled with solution of caustic potash. Connect the latter with the gas bag, or with the pneumatic trough C, containing warm water. Apply heat to the retort, and, when the temperature approaches 200° C. (392° F.), nitrous oxide gas will be abundantly disengaged. As the reaction progresses the temperature may be cautiously increased. The traces of nitric oxide will be retained by the solution of ferrous sulphate, and the free chlorine (if present), by the solution of caustic potassium.

Nitrogen monoxide, or nitrous oxide, is a colorless gas, having a sweet taste, and a pleasant odor. Its specific gravity is 1.52 (*Colin*), 1.6 (*Dalton*). It is somewhat soluble in cold water, and more so in alcohol. When the gas is compressed by 30 atmospheres, at 0° C. (32 F.), it liquefies to a colorless liquid. Wills has solidified it to a form resembling snow.[4] The gas supports combustion, in consequence of its ready decomposition with liberation of oxygen, which, in reality, is the combining agent. It derived the name *laughing gas*, from the curious effect it produced upon the system when mixed with oxygen and inhaled. At present, nitrous oxide gas may be obtained in our cities compressed

[1] *Phil. Trans.*, 1873.

[2] First called Dephlogisticated nitrous gas or Oxyd of Azot. Kerr in 1802 proposed Oxy-azotic gas as "a very regular term."

[3] *Elements of Chemistry*, by Lavoisier, 1802, Vol. ii.

[4] *Journ. Chem. Soc.*, 1874.

into cylinders, and ready for use, and for dental purposes it is extensively employed in this form, and the dentist is thus saved the trouble of its preparation.—L.

Properties and Uses—Nitrate of ammonium has rarely been employed therapeutically. Dr. Walter Coles (*Am. Med. Times*, November, 1860, p. 311) has advised its use as a tonic, and for the purpose of introducing an increased quantity of oxygen into the system. It certainly has been found beneficial in cases of excessive debility from suppurating abscesses or ulcers, where the mucous tissues present a dark appearance, and has, apparently, been of service in several diabetic patients. The dose is from five to fifteen grains, repeated two or three times a day.—K.

AMMONII PICRAS.

PICRATE OF AMMONIUM. CARBAZOTATE OF AMMONIUM.

Formula, $NH_4C_6H_2(NO_2)_3O$; molecular weight, 245.58.

Preparation.—Add one part of picric acid to eight parts of distilled water, and bring the mixture to the boiling point. Then, with constant stirring, add aqua ammonia until in slight excess, and filter through paper while hot. Mix the filtrate with eight parts of alcohol, and, when cool, strain, and dry the precipitate upon blotting paper, by exposure to the atmosphere.

The picric acid unites with ammonia in the foregoing operation, forming a dark orange-colored solution (picric acid dissolves with lemon-yellow color), from which the mechanical impurities are separated by filtration through paper. Owing to the fact that picrate of ammonium is almost insoluble in alcohol and is soluble to a considerable extent in water, the alcohol is added, thus precipitating a larger amount than could be obtained by crystallization. Another advantage derived from the use of alcohol, results from the fact that a common impurity in commercial picric acid is a resinous substance produced by the action upon carbolic acid of the acids employed in making the picric acid. This resin is held in solution by the alcohol, but precipitates with the picric acid if water only is used.

History.—Picrate of ammonium, obtained by the preceding formula, is in the form of minute lemon or orange colored acicular crystals. It is intensely bitter, and imparts, in solution, a permanent yellow color to organic bodies, more particularly such as horn, the finger nails, hair, etc. Solution of picrate of ammonium precipitates most of the solutions of alkaloidal salts, forming insoluble picrates of the alkaloids.—L.

Properties and Uses.—The therapeutical virtues of picrate of ammonium are not well understood. Administered for some time, to certain animals, it has occasioned a yellow discoloration of the conjunctiva, as well as of the urine, also diarrhea, leanness, flatulency, spasmodic twitchings, etc.; and the globules of the blood, both the red and the white, become seriously changed in their character. With man, somewhat similar effects have been observed. At one time this agent was highly extolled as an effective remedy for intermittent fever, and was also suggested for the destruction of trichina in man, but no positive or satisfactory results have been derived from its employment in these cases. Its chief use at the present day is in the preparation of colors for staining in histological investigations.—K.

AMMONII SULPHAS.

SULPHATE OF AMMONIUM.

Formula $(NH_4)_2SO_4$; molecular weight, 131.84.

History.—This salt was discovered by Libavius (*Roscoe & S.*), but was first investigated carefully by Glauber.[1] It is found in certain volcanic districts, but is made in immense amounts from ammoniacal gas liquor, from which the ammonia is liberated by lime, and then conducted into dilute sulphuric acid; after which this solution of impure sulphate of ammonium is strained, evaporated until the salt separates, and the impure brown mass formed is afterward purified. Sulphate of ammonium crystallizes in long, transparent, six-sided crystals, which are isomorphous with potassium sulphate, and have a strongly saline taste. They dissolve in their own weight of boiling water, and in two parts of cold; insoluble in alcohol of less specific gravity than 0.850. Sulphate of ammonium is made in large amounts in this country, and is mostly consumed in the preparation of alum,[2] aqua ammonia, and chloride of ammonium. It also enters into the composition of ammonio-ferric alum, and is used to make other preparations of ammonium, such as iodide of ammonium, and as a fertilizer.—L.

Properties and Uses—Sulphate of ammonium has not been employed as a therapeutical agent.—K.

AMYL NITRIS.

NITRITE OF AMYL.

Formula, $C_5H_{11}NO_2$; molecular weight, 116.78.

History.—Nitrite of amyl was discovered by M. Balard, in 1844, who gave an account of its chemical and physical properties. Chapman and Smith,[3] and afterward Chapman,[4] investigated it carefully. Tanner recommends that it be prepared by a process similar to that of Mr. Redwood for making nitrous ether. Maisch[5] distils purified amyl-alcohol with nitric acid. In all cases the operation requires the utmost care and attention, notwithstanding which by-products will be largely produced which require careful elimination.

Preparation.—The process of Professor Maisch, as modified by him from Balard's, is essentially as follows: Mix pure amyl-alcohol with its bulk of nitric acid in a rather large glass retort and heat gradually until the reaction commences, then remove the fire and allow the subsequent spontaneous distillation to proceed until the temperature reaches 100° C. (212° F.). This distillate only is reserved, as, above that temperature, considerable nitrite of amyl, and ethyl-amylic ether are produced. The reserved distillate is agitated with solution of caustic potassa in order to remove free acids. The decanted liquid is carefully distilled, and those portions only that distil between the temperatures 96° C. (205° F.), and 100° C. (212° F.), are to be reserved. The yield is small.

Tanner mixes ten parts of amyl alcohol with one of sulphuric acid

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[1] It is mentioned in the early works on chemistry as *ammoniacal vitrol, vitriolic sal-ammoniac*, and *Glauber's secrete sal-ammoniac.*

[2] There is little potash alum now in market.

[3] *Journ. Chem. Soc.*, 1866 and 1867.

[4] *Pharm. Journ. and Trans.*, 1871.

[5] *Am. Journ. Pharm.*, 1871, p. 147.

in a capacious glass retort containing some copper wire. One part of nitric acid is added, having been previously diluted with its volume of water. Heat is now applied, and distillation conducted until a temperature of 98° C. (208° F.), is reached; the heat is then discontinued, and when the temperature of the liquid within the retort has fallen considerably, another part of nitric acid is added through a safety funnel, and distillation conducted as before. The operation is repeated until the distillate rather more than equals the bulk of the amyl-alcohol employed. This constitutes impure nitrite of amyl, and may be purified by the directions given in Mr. Maisch's process.

Nitrite of amyl is an ethereal, yellowish fluid, of a not unpleasant odor, and having the sp. gr. 0.877. It is soluble in alcohol and ether, but insoluble in water, and boils at 96° C. (205° F.). When much diluted with ether and allowed to act upon sodium in excess, almost pure nitrogen is produced. If the *nitrite* be in large excess, monoxide of nitrogen (N_2O), is evolved. It is converted by the oxidizing action of chromic acid into nitric acid, valerianic acid, and valerianate of amyl, (*Chapman* and *Smith*). The process is explained as follows: When amyl-alcohol, $C_5H_{12}O$, or $C_5H_{11}HO$, is acted upon by nitrous or nitric acid, a complicated reaction ensues, resulting in the formation of several compounds, among them, amyl nitrite, which has the composition $C_5H_{11}NO_2$.—L.

Properties and Uses.—Nitrite of amyl was introduced to the profession as an anesthetic, in 1863, by Dr. B. W. Richardson, of England; but, from many experiments that have subsequently been made, it appears that unconsciousness does not follow its inhalation until its full effects have been experienced, and these effects are due to its absorption by the various tissues of the system. The blood becomes blackish or of a chocolate color, and the absorption of oxygen, as well as the production of carbonic acid, are greatly lessened; and, after a time, from its continuous action, the blood presents a modification appreciable with the spectroscope, and the hemoglobin loses its faculty of crystallizing. From its action, vascular and mucous tissues present a dark appearance, the number of pulsations diminish and then increase, the capillaries dilate, arterial tension becomes greatly lessened, and the temperature decreases. Bader and Goodhart, at Guy's Hospital, found that three drops of the nitrite, on sugar, occasioned considerable dilatation of the retinal veins, and especially of the papilla of the optic nerve, so as to leave no doubt as to the production of a cerebral hyperemia. Nitrite of amyl likewise possesses a paralyzing influence on both nerves and muscles. Its effects, however, do not appear to be the same with all who inhale it; some are affected by a very minute amount of it, while others require large doses for inhalation, even to forty drops. With some its action is succeeded by nausea; others, again, will have their vision dimmed, or will be annoyed by a yellow cloud in the field of vision, yellowish and green sparks or rings, and persons around them will appear to be surrounded with a yellow or dark tint. Occasionally, its inhalation is followed by pallor, great depression and collapse. On these accounts, great care and prudence must be observed in its administration, and especially on the first occasion of its inhalation. With some, repetition of the inhalations appears to lessen its more serious effects; but a too prolonged inhalation should always be avoided, as it is apt to prove fatal. It should not be employed in serious organic diseases of the heart, or of the brain.

The usual immediate effects from inhalation of the nitrite of amyl

are those observed at first by Guthrie, viz., flushing of the face, throbbing of the carotids, and acceleration of the heart's action. Some patients, after its administration, complain of throbbing in the temples, fluttering of the heart, and a death-like sensation of breathlessness; others feel a tingling throughout the system, or cramp-like pains in the extremities. Dr. Richardson who introduced nitrite of amyl as a remedial agent, considers its physiological action to be directly exerted on the ganglionic nervous tract; that it paralyses so that the nervous supply over the extreme vascular system is impaired; that this paralysis of the nerves travels from the periphery inwards, diminishes muscular contractility, followed by relaxation and dilatation of the capillaries. This effect of the article, led Dr. R. to suggest it primarily as a remedy for excessive spasmodic action, as, in tetanus, angina pectoris, etc., in which affections it has proved very successful. The action of the nitrite is curative only so far as it controls the spasms present,—that is, it prevents death, and thus allows time for recovery, either from the natural powers of the patient's system, or from the employment of the proper hygienical and therapeutical measures. The various maladies in which it has been successfully employed, are, angina pectoris, tetanus, uncomplicated neuralgia, spasmodic asthma, spasms of the fibers of involuntary muscles, as, in intestinal colic, epilepsy, hystero-epilepsy, nervous headache due to anemia, in which it acts promptly, chorea, syncope, puerperal convulsions, spasmodic pains in some of the more important organs of the trunk, trismus nascentium, and intermittent fever. While its inhalation may cure certain of these affections, it must be borne in mind, that, with many of them, a very prompt and material amelioration of the troublesome or painful symptoms are all that can be expected, as, in epilepsy, eclampsia, hysteria, etc.

Chloroform contracts the capillary vascular system, and in several serious cases of narcosis following the inhalation of chloroform, the prompt employment of the nitrite of amyl as an antagonizing agent has been successfully resorted to. In sea-sickness, the nitrite has been used with much efficiency. It has likewise been advised in the collapsed stage of cholera, by Gamgee, and others, but, Dr. Brunton has stated, from a doubt whether it dilates the pulmonary capillaries, which are contracted in this disease, that he considers it should be used, if at all in this disease, either internally or by subcutaneous injection, and not by inhalation; also in spasmodic asthma when the arterialization of the blood is impaired.

In the employment of nitrite of amyl, it is highly important that a pure article be had. When used in inhalation the dose is from two to five drops, which are to be placed upon a folded linen or handkerchief, and then immediately inhaled for from three to six minutes. The article is also put up by manufacturers in hermetically sealed glass tears, and called "pearls of nitrite of amyl." As the fluid is exceedingly volatile, this is undoubtedly the best form in which to keep it; and these pearls can be had, each one containing two, three, or five drops. All that is necessary, being to place the pearl in the center of the handkerchief, then crush it, and inhale the vapor. Internally, it is rarely employed in doses of from two to five drops in a small amount of spirit; thus used, its action is very energetic and requires to be closely watched. In poisoning by chloroform, and in the collapse of cholera, two or three drops may be subcutaneously injected.—K.

AMYLENUM.

AMYLENE.

Formula, C_5H_{10}; molecular weight, 69.85.

History.—Amylene was discovered by Balard, in 1844, who obtained it by distilling amyl-alcohol with zinc chloride. It was introduced to the medical profession by Dr. Snow, in a paper presented to the Medical Society of London, January 10th, 1857. In the same year, M. Duroy experimented with it carefully, obtaining but one and one-fourth ounces of amylene from ten pints of amyl-alcohol. He also found that all the specimens upon the market, at that time, were very impure.

It is obtained by distilling equal parts of amyl-alcohol and zinc chloride, by which means amylene, amyl-alcohol, and other substances are obtained. It is to be purified by fractional distillation from chloride of calcium, care being taken that the hydrocarbons of higher boiling-point are rejected. Amylene is a thin colorless liquid, having a fragrant odor, being freely soluble in alcohol and ether, and almost wholly insoluble in water. It boils at 35° C. (95° F.), and has the specific gravity 0.663 at 0° C. (32° F.).

The experiments of Duroy show that it is not colored, and does not form valerianic acid when acted upon by caustic potassa. It burns with a bright smoky flame. Sulphuric acid, previously diluted with half its bulk of water, decomposes it into polymerides of little general interest, one only, diamylene ($C_{10}H_{20}$), having been closely studied. Amylene is known by modern chemists under the name *isopentene*.—L.

Properties and Uses.—Dr. Snow introduced this agent as an anæsthetic, but a large amount of it is lost during inhalation, from not being absorbed, besides, death has occurred very suddenly from its use. The French Academy of Medicine gave it a very careful investigation, and rejected it as an uncertain and hazardous agent. It has, therefore, not come into general use, as few physicians would care to replace chloroform or ether by so unsatisfactory an article.—K.

ANACARDIUM.

Nat. Ord.—Anacardiaceæ, *Lindley.* (Terebinthaceæ, *Kunth.*) *Tribe.*—Anacardieæ. The nut of Anacardium occidentale, *Linn.*

Common Name.—Cashew-nut.

ILLUSTRATIONS.—*Strong's American Flora*, p. 125.

Fig. 3.

Cashew-nut.
Natural size.

The Cashew-nut is a small tree, native of the East and West Indies and South America. The leaves are alternate, simple, entire, obtuse, and borne on short leaf-stalks. The flowers are very numerous, small, and fragrant; they are produced in terminal loose panicles. What is known as the "Cashew-apple" is the enlarged juicy peduncle which bears the nut. When ripe, it is of a golden yellow color, obovate in shape, and has a pleasant acrid flavor, but is somewhat astringent. It is much eaten by the natives. The Cashew-nut is attached and hangs from the end of the Cashew-apple. It is kidney-shape, and about an inch long. It consists of an edible kernel, surrounded by two shells. The outer shell is smooth, and of a bright brown color. Between the two shells

there is a very caustic oily substance which produces troublesome sores within the mouths of those who injudiciously attempt to crush the nut between the teeth, in order to obtain the kernel. When fresh, the kernel is pleasant to the taste, and is largely consumed by the natives. Fig. 3 is a drawing, natural size, of Cashew-nut in our possession.

History—The Cashew-nut was first examined by Cadet, who found in it gallic acid and an acrid resin. Afterward, De Mattos,[1] by a more careful investigation, found, in addition, tannin, an extractive substance, a gum resin, and some green coloring matter. But the most interesting investigation was made by Stædeler, in 1847, 1848,[2] who examined the viscid liquid contained between the two shells of the nut, having extracted it by means of ether. This liquid is fluid at 60° F., congeals at 50° F., is soluble in alcohol and ether, but insoluble in water, and is acrid and caustic; when placed upon the skin, it promptly produces vesication. Stædeler separated this liquid into two constituents, one of which was an oily substance constituting about ten per cent., fluid at even low temperatures, and forming the vesicating part of the liquid, which he named *cardol*, $C_{21}H_{30}O_2$. This was associated with an acid substance, white and crystalline when pure, capable of forming salts with bases, some being crystalline, and others amorphous, and to which Stædeler gave the name *anacardic acid*. This acid is not vesicating. The tree furnishes a gum in abundance (*gomme d'acajou*, Fr.), which is brittle, and transparent, resembling gum acacia, with the exception of a slight astringency which it possesses. When the trunks of the trees are tapped, a milky juice exudes, which is white, when fresh, but turns black on exposure, and, in India, is used as a varnish. It stains cotton or linen deep black by exposure to air. The apple yields a liquor by fermentation, called "Cashew wine," which is said to be a wholesome drink. The roasted nuts are edible, care being taken, however, that the fumes from the roasting shell do not come into contact with the face, as thereby painful blisters will be produced upon the exposed portions.—L.

Properties and Uses.—The fresh juice of the rind is very acrid and corrosive, producing redness, tumefaction, inflammation, and blisters, on which account it has been employed in the West Indies for the removal of warts, corns, ringworms, and as a stimulant to indolent ulcers. Blisters formed by its application are apt to be very troublesome and annoying. The kernel, especially when roasted, is edible, having a rather sweet and agreeable flavor. The bark of the tree was used by Adanson, to cure himself of the peculiar fever of Senegal; it has an agreeable taste, does not appear to affect the nervous system, has a favorable influence upon digestion, and is very effective in its action, having conquered the Senegal fever in cases in which the largest doses of quinia proved unavailable. *Comptes Rendus*, xxvi, p. 254.—K.

ANEMOPSIS CALIFORNICA.

Nat. Ord.—Saururaceæ. The root of Anemopsis Californica, *Hooker.*

Common Name.—Yerba Mansa.

Description.—This is a perennial herb, native of wet places in Southern California and in the northern part of Mexico. The *stem* is erect,

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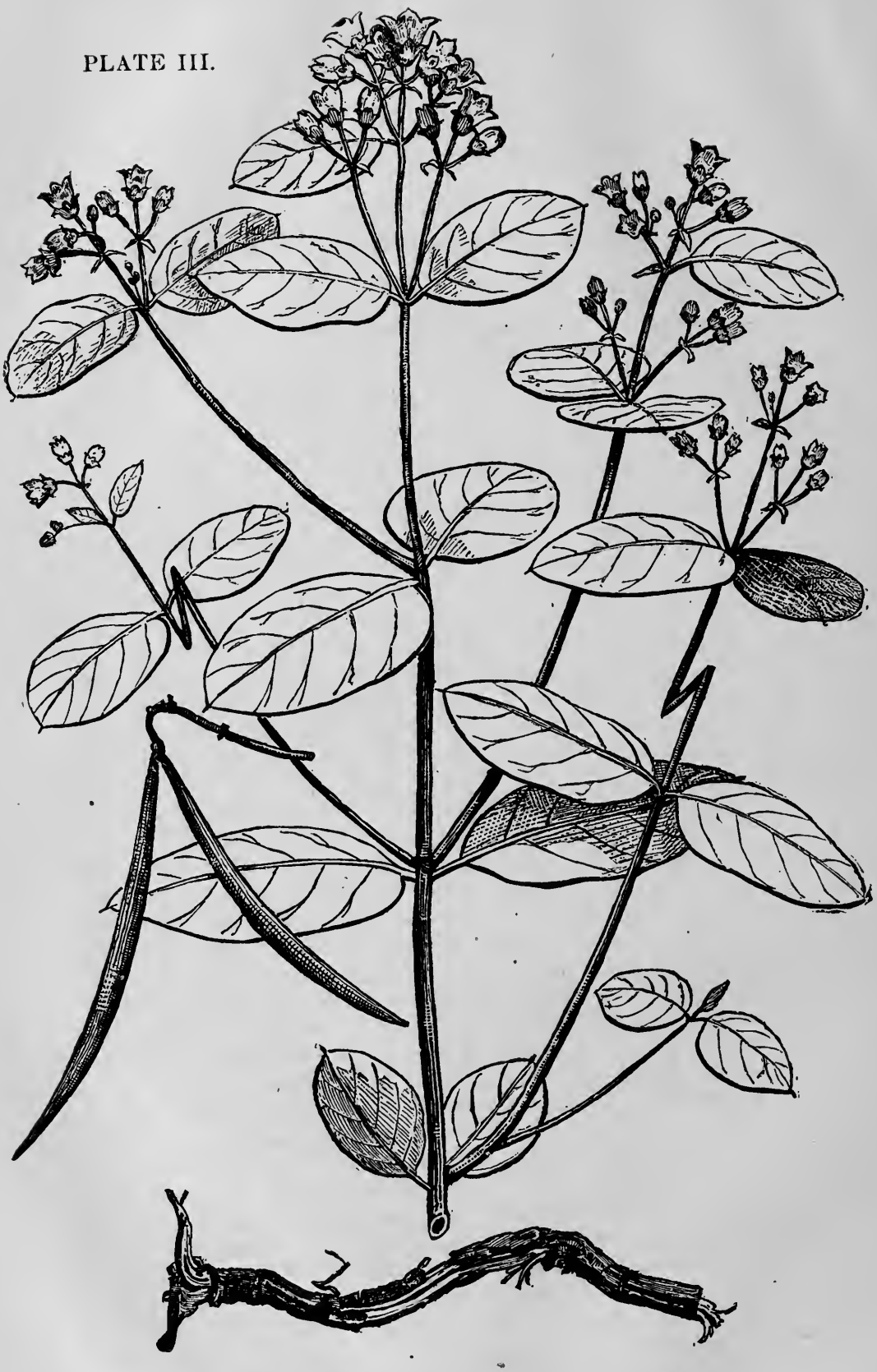
[1] *Jour. de Pharm.*, 1831. [2] *Chem. Gazette*, vol. vi.

about a foot high, and bears a close terminal spike of flowers. Near the middle of the stem is borne a large clasping leaf, from the axis of which a few short, slender branches are produced. The *leaves* are mostly in a radical cluster at the base of the stem; they are from two to four inches in length, one-half as broad, of a firm, leathery texture, smooth and entire; their outline is oblong, with a cordate base. The leaf-stalks are about the length of the leaf, dilated at the base and pubescent along the margin. The stem is remarkable for sending out from its base, slender, unbranched stolons, from three to six feet long. These stolons are of rapid growth, and produce, at intervals of about a foot, roots and a cluster of leaves, which in another year become a separate plant. The *flowers* are small, and borne in a thick, dense spike (spadix), about an inch in length. At the base of the spadix are about six large, petaloid, involucre leaves in the same manner as the flowering dogwood, which give to the entire inflorescence the appearance of a single terminal flower. The *flowers* are small, and destitute of either corolla or calyx, but are each subtended by a small colored bract. The *stamens* are about six, with short filaments and borne on the ovary. The stigmas are generally three, spreading, and about as long as the stamens. The *ovary* is one-celled, immersed in the spadix and consolidated with it. The seeds are small, light brown, and attached to the parietal placentæ of the capsule.

History.—There is a pungent, disagreeable, somewhat aromatic odor, and a sharp, biting taste, imparted by all parts of the plant, when chewed, followed by a sense of astringency. The Indians of Southern California, Mexico, and Arizona, according to Dr. Palmer (*Am. Journ. Pharm.*, Dec., 1878), employ both the roots and leaves. Dr. Wm. H. George, of California, first brought the drug to our notice, the roots being the part employed. When dried, they are of a brown color, wrinkled, from one-fourth of an inch to half an inch in diameter, and seem to grow mostly horizontally near the surface of the ground. From four to ten fleshy rootlets spring in a clump from one side of the root at the base of the leaves, and run downward. A strange peculiarity of the lot of roots examined by us, is, the presence of numerous grass stalks that pierce and grow through them, sometimes appearing several inches from the place of entrance. Internally, the root is pinkish; and running lengthwise through it, about midway between the surface and the center, is a ring of coarse fibrous medullary matter. The upper portion of the root is not unfrequently brown and half decayed. The active principles of this root are freely extracted by alcohol; they are, firstly, about five per cent. of a volatile oil, which is heavier than water, is soluble in ether, alcohol, chloroform, and disulphide of carbon, and possesses the exact odor and taste of the plant. This oil turns blue when agitated with hydrochloric acid. Secondly, a vegetable tannate, which forms a black precipitate with ferrous sulphate. There is no alkaloid, or other body present, worthy of notice. (*Am. Journ. Pharm.*, Jan., 1880).—L.

Properties and Uses.—This plant was introduced to the profession by W. H. George, of California. He states that the natives esteem it a panacea far excelling the Yerba Santa, and successfully employ it in all malarial fevers, in diarrhea, and in dysentery. (*Eclectic Med. Journ.*, 1877, p. 238). In a letter to the writer he observes that the natives frequently carry the root with them, chewing it and swallowing the juice, and consider it a certain remedy for cough and pulmonary affections. They likewise employ a strong infusion of it as an efficacious local

PLATE III.



APOCYNUM ANDROSÆMIFOLIUM.

application to saddle and collar galls on horses. Dr. George considers it a stimulant tonic, astringent, carminative, and antiemetic. He has successfully employed it in gonorrhea with profuse discharge, and thinks it equal to cubebs in this disease, and more pleasant to take. The writer has tried it in one case of gonorrhea, and in several cases of bronchial cough, with favorable results. The dose of the fluid extract is from ten to sixty minims, in syrup, repeated every three or four hours.—K.

APOCYNUM ANDROSÆMIFOLIUM.

Nat. Ord.—Apocynaceæ. *Sub Ord.*—Euapocyneæ.

The root of Apocynum Androsæmifolium (*Linn*), gathered in autumn after the leaves and fruit have matured.

Common Names.—Dog's-bane, Indian Hemp, Bitter Root.

ILLUSTRATIONS.—*Bot. Mag.*, 280; *Rigel's Med.*, 36; our Plate III.

(See *King's American Dispensatory*, 8th ed., p. 113.)

Description.—Apocynum androsæmifolium has a close resemblance to A. cannabinum, but is found in more northern latitudes, being the more common species in Canada and in the North-eastern States. The leaves are oval, roundish, about three-fourths as wide as they are long, and end in short mucronate points. They are smooth, lighter color on the under surface, and are attached to the stem, at nearly a right angle, on leaf-stalks about a quarter of an inch in length. The flowers are larger than in *Apocynum cannabinum*, and are disposed in loose, terminal, panicled cymes, extending beyond the leaves. The corolla is flesh-colored, with spreading lobes, and more than twice the length of the calyx. (See Plate III, drawn from a plant furnished by Mr. F. H. Hosford.)

History.—The root of this plant is rarely found in market. It bears a general resemblance to that of Apocynum cannabinum, although its distinguishing characteristics are well marked, and sufficiently distinct to forbid confusion, and to prevent substitutions from being practiced upon those who have compared the two roots. Apocynum androsæmifolium has a long running root. (Plate III.) When dry, it is contorted, frequently having the woody remains of its stalks attached. It is shriveled longitudinally, and often marked by transverse fractures, that extend through the bark and show the white woody center. Occasionally the bark scales off. The root breaks with difficulty, its central part being woody. Externally, the bark is dark brown, white upon its inner surface, and readily separates from the central or ligneous part of the root; it is very bitter. The central part of the root is smooth and firm, bends before breaking, and usually requires considerable twisting before the woody fibers give way. Attached to the root are rootlets, not very plentiful, which bear a general resemblance to the main root, their central portion being woody and covered by a brown epidermis. The confusion that has existed regarding the roots of Apocynum androsæmifolium and Apocynum cannabinum results from the general resemblance of the plants, and from the fact that the names *bitter root* and *Indian hemp* have been applied indiscriminately to both species by herb gatherers and country people. A. cannabinum is quite plentiful in localities from which our (Cincinnati) market is supplied, while the A. androsæmifolium is scarce.—L.

Properties and Uses.—See *King's American Dispensatory*, p. 114.

APOCYNUM CANNABINUM.

Nat. Ord.—Apocynaceæ. *Sub Ord.*—Euapocyneæ.

The root of Apocynum cannabinum, *Linn.* (*Syn.*—A. hypercifolium, *Ait.*) gathered in autumn after the leaves and fruit have matured.

Common Names.—Bitter Root, Indian Hemp.

ILLUSTRATION.—Our Plate IV.

(See *King's American Dispensatory*, 8th ed., p. 114.)

Description.—This is an erect, branching plant, from two to four feet high, which is found growing throughout the United States, on the borders of fields and in other similar localities. The stem is covered with a strong fibrous bark, which is green when the plant grows in the shade, and of a reddish-brown color when in sunny localities, in which situations the plant is usually found. The fibrous bark was used by the Indians, and on this account the name *Indian hemp* has been applied to this plant; but it is a bad term, as it has led to much confusion, from the fact that this is the common name for several other plants. The plant should *never* be designated by this name. The entire plant exudes a milky juice, when wounded. The leaves are opposite, and attached to the stem at an acute angle. They exhibit considerable diversity of shape in plants that grow in different localities, and form several well-marked varieties; presenting, in the different varieties, modifications in outline from oblong to oval, with the bases of the leaves acute or sub-cordate. The most common form has oblong-lanceolate, veiny, entire leaves, on leaf-stalks, about a quarter of an inch long, and end in a short, mucronate point. The flowers are small, numerous, and in close, peduncled, flat, cymes, which are shorter than the lateral branches. The calyx is small, with five, narrow, sharp lobes; the corolla is five parted, with erect lobes, white or pale-red color, and but a little longer than the calyx. The stamens are five, small, distinct, and included. The pistil has two ovaries covered by two united, sessile, fleshy stigmas. The fruit, which is produced by only a few of the flowers, consists of a pair of slender, diverging pods, containing numerous small seed, which are furnished with a bunch of silky white hair at the apex. (See Plate IV.)

History.—The root of the plant is gathered by diggers and thrown upon the market under the names, *bitter root*, or *Indian hemp*. It is not to them known as the true Apocynum cannabinum, few of the diggers being aware that two species exist. Some writers have supposed that the roots of A. cannabinum and A. androsæmifolium are not to be distinguished from each other. Doubtless, such assertions have been made after having compared the roots sold upon the market under the foregoing names, in which case they are usually *identical*, being, in almost every instance, obtained from the Apocynum cannabinum. There is, however, a marked difference both in the external appearance and the internal constitution of these two roots, and those who have compared authentic specimens can distinguish the two at a glance.

The root of A. cannabinum, gathered in the autumn and dried, is about one-third of an inch in diameter, wrinkled longitudinally, and marked by occasional transverse fractures through the bark, which show the white central portion. It consists of a bark, externally ash-gray in color, beneath which is a thin, brown, corky layer, and within this, the inner bark, which is of a pale pink color. The remainder of the root is composed of white medullary matter, perforated by

PLATE IV.

APOCYNUM CANNABINUM.

numerous, longitudinal tubes, disposed more thickly in concentric circles about the fortieth of an inch apart, or forming a single circle. Radiating from the center, are delicate medullary rays. When gathered in the spring, or in early summer, the center is pierced by a light pith, or a small cavity. The root, when dry, is brittle, and snaps readily, giving a clear smooth fracture. As found in market, there are few, if any, fibers attached, although, when fresh, the root is plentifully supplied with secondary roots; but as they are very brittle when dry, they do not long remain attached. We call attention to the exact engraving presented of the dry root, and also to a section of the root magnified (Plate IV), and suggest that a comparison be made between these and those of Apocynum androsæmifolium (Plate III). The woody portion of the root is slightly bitter; the bark is extremely bitter and disagreeable.—L.

Properties and Uses.—See King's *American Dispensatory*, 8th edition, p. 115.—K.

ARAROBA.

Common Names.—Goa powder, Bahia powder, Brazil powder, Ringworm powder, Chrysatobine, Chrysarobin.

History.—As found in commerce, this agent is in the form of a powder of different degrees of fineness, of a color ranging from light yellow to dark chocolate. It resembles the partly-decayed matter occasionally observed in cavities of old trees and stumps, and is often mixed with irregular woody fragments. Dr. Fayrer called attention to this substance in the *Med. Times* and *Gazette*, October, 1875, but was unable to give its origin, farther than that it reached Bombay through Goa on the Malabar coast, thus acquiring the name *goa powder* by which it is commonly known. Its source was kept secret for some time, and the powder was sold at exorbitant prices. Recent investigations, however, have fairly established that it is the partly-decayed matter of a *South American* tree, and thus, curiously enough, by the way of distant India, where it had been long used, this product of the South American forests was introduced to the medical profession.

Araroba is remarkable for sometimes yielding from eighty to eighty-five per cent. of chrysophanic acid, as shown by Attfield, in 1875, and, according to the same authority, the remainder of the powder examined consists of seven per cent. of a glucoside and bitter matter, two of a resinous substance, five and a half of a red woody fiber, and one-half per cent. of ash. The ashes consist chiefly of silicate of aluminum and sulphates of potassium and of sodium. We have examined several specimens upon the market, and, in all cases, have obtained a much smaller proportion of chrysophanic acid than stated by Mr. Attfield. Therefore, we conclude, that he must have procured an unexceptionably rich specimen of araroba, or else that which now reaches this country is very inferior.

Araroba readily yields chrysophanic acid to benzine. When heated in a suitable vessel, a sublimate is obtained, which, doubtless, consists largely of the aforementioned acid, as it is colored red by alkalies in solution. Araroba is chiefly employed for the preparation of chrysophanic acid (see p. 5). Liebermann and Siedler are authority for the statement that chrysophanic acid does not exist ready formed in

araroba, but is formed by oxidation of a natural constituent, to which they give the formula $C_{30}H_{26}O_7$, and the name *Chrysarobin*, (previously applied to araroba).

Origin.—Mr. E. M. Holms suggested that a species of *Cæsalpinia* probably produced this powder, and, for some time, his conclusion was generally accepted, although not without reserve. Dr. J. M. de Aguiar, of Bahia (1879), published an article in pamphlet form upon this subject,[1] which tends to lighten the mystery that has heretofore surrounded its source. He informs us that *araroba* is derived from a large intertropical tree, the ordinary height of which is eighty or one hundred feet. It belongs to the Leguminosæ, and tribe of Dalbergieæ, resembling, in some respects, *Dalbergia miscolobium* (*Benth*), and *Andira fraxifolia* (*Benth*). After having given a careful botanical description, the author concludes that the tree has been heretofore undescribed, and proposes for it, the name *Andira araroba* (*Aguiar*), "since the drupaceous fruit, panicled inflorescence, purple flowers, and other characters clearly point to its being an *Andira*."

The araroba powder is obtained by cutting down the older trees, as they yield it in greatest abundance, and then scraping the powder from cavities found by splitting the trunk into longitudinal sections. The tree contains an abundance of resin, by the oxidation of which, Dr. de Aguiar believes, the araroba is produced. When fresh, it is of a pale primrose color, but, by age, changes to the color of rhubarb, and, eventually, becomes dark-purple. The tree exists abundantly in all the southern part of the province of Bahia, although the powder now chiefly comes from Camamu and Taperoa.—L.

Properties and Uses.—In the Indies this agent has been employed for the removal of tænia solium, and in the treatment of certain cutaneous maladies. Attfield, Fayrer, Da Silva Lima, Squire, Hebra, Bernier, Blanc, Thin, and many other medical men have successfully employed this powder in the treatment of herpes circinatus, porrigo scutulata, porrigo decalvans, sycosis, favus, psoriasis, eczema, lichen, acne, and other diseases of the skin. The powder is mixed with vinegar or lemon juice to form a thin pasty mass, or, is well incorporated with glycerin or starch paste, and then applied over the eruption once or twice a day, for from five to eight days successively, in which period of time the cure is generally effected. Its application causes, after some length of time, a temporary uneasy sensation in the part to which it is applied, the eruption assumes a whitish appearance, and the surrounding tegument presents the appearance as of a dark stain; as the cure progresses, the skin assumes its normal color. For internal use, it may be taken in the form of pills, made by incorporating it with medicinal soap. For external application, it may be used as above stated, by means of a small brush, or, a tincture of the powder may be painted upon the affected parts. It may be also used in the form of an ointment, consisting of from fifteen to sixty grains of the powder, from fifteen to thirty drops of acetic acid, all thoroughly mixed with an ounce of benzoinated lard. At the present time, however, chrysophanic acid (*which see*) is used in preference to the goa powder.—K.

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[1] *Pharm. Journ. and Trans.*, July, 1879. Also *New Remedies*, Sept., 1879.

BARIUM DIOXIDE.

PEROXIDE OF BARIUM.

Formula, $Ba O_2$; molecular weight, 168.72.

Description.—This preparation is formed when baryta (barium monoxide Ba O), is heated to redness in a current of dry oxygen. It usually contains silica, lime, and iron oxide, which substances consequently exist as impurities in peroxide of hydrogen prepared from commercial barium dioxide. Therefore, aside from other considerations, it is better to use hydrated dioxide of barium to prepare this compound.

HYDRATED DIOXIDE of BARIUM, $Ba O_2 + 8H_2O$, is made as follows: Add powdered barium dioxide gradually to dilute hydrochloric acid, until the acid is nearly neutralized; cool, filter, and add cautiously baryta-water, until the silica and metallic oxides cease to separate and the white hydrated barium dioxide appears; then filter and add concentrated baryta-water until a precipitate ceases to form. Collect the precipitate upon a filtering-paper, wash with cold water and preserve in well corked bottles. It is used for the preparation of hydrogen dioxide, but otherwise is not employed in medicine.—L.

BERBERIS AQUIFOLIUM.

Nat. Ord.—Berberidaceæ. *Tribe.*—Berberæ.

The root of Berberis Aquifolium (*Pursh*). *Syn.*—Mahonia Aquifolium (*Paxton*).

Common Name.—Mountain grape.

ILLUSTRATION.—*Pursh*, Vol. I, Plate IV. *Bot. Reg.*, 1425.

Description.—This is a tall shrub, native of the western section of the United States. It grows from Colorado to the Pacific Ocean, and is especially abundant in Oregon and the northern part of California. The *stems* are about six feet high, erect, and of rapid growth. The *leaves* are alternate, and consist of three or four pairs of leaflets, and an odd one. They are evergreen, coriaceous, bright and shining upon the upper surface, and very ornamental; hence, the shrub is frequent in cultivation, often under the improper name "holly." The *leaflets* are smooth, ovate, from two to three inches long, and one-half as wide. They are acute, sessile, pinnately veined, and the margin is indented with from fifteen to thirty repant spiny teeth. The lower pair of leaflets is from one to two inches distant from the base of the common petiole. The *flowers* are numerous, small, yellowish-green, and appear in early spring, borne in fascicled, terminal racemes. The *calyx* has nine distinct sepals, colored like the petals, and disposed in two rows, the outer of which consists of three sepals (bracts?). The *petals* are six, distinct, orbicular, and in rows of three each. The *stamens* are also six, and opposite the petals; they have irritable filaments, and extrorse anthers, opening, each by two little valves, hinged at the top. The *fruit*, which is known as "Oregon grape," is a cluster of purple berries, each containing an agreeably acid pulp, and from three to nine seeds.

History.—Berberis Aquifolium belongs to the section Mahonia of the genus *Berberis*, which section is considered by some botanists a

distinct genus. The following synopsis of the difference between the two sub-genera is taken from "*Berberidaceæ*."[1]

The Berberis proper has	Mahonia has
Simple leaves clustering in the axis of a simple or three-parted spine.	Oddly, pinnately, compound leaves, with no spine at the base but with spiny-toothed leaflets.
The petals have two glands on the inside of each, at the base.	The petals are glandless.
The filaments have no teeth.	The stamens have a tooth on each side of the filament, near the top.
Berries two to three-seeded.	Berries three to nine-seeded.

The section "Mahonia" is represented in the Western United States by six species, viz :—*Berberis pinnata, Lag.*, a tall shrub with the general appearance of B. Aquifolium, distinguished from it by the leaflets, which are glaucous underneath, and the lower pair approximate to the base of the petiole; *Berberis repens, Lind.*, a small creeping plant, with leaves often ternate, and leaflets nearly orbicular, and which has been much confounded, and frequently described as Berberis Aquifolium. *Berberis nervoa, Pursh*, a small erect shrub, with leaves often longer than the stem—it appears to be more generally distributed than the other species. The chief characteristics of this species are, the leaflets are three-veined from an oblique base, the common petiole is jointed "like a bamboo stem," and the flowers are in slender racemes. The other two species, *B. Fendleri* and *B. Fremonti*, are of rare occurrence.

Berberis Aquifolium and the other species long in use in domestic practice throughout the West, were brought into general notice a few years since by Dr. Bundy, of California. From an examination of the drug, as thrown upon the market, we find the species are confounded, several of them being generally sold as B. Aquifolium. The B. nervosa is more commonly met with in these sophistications, but we have likewise noticed B. repens in considerable amount. This confusion is, perhaps, unimportant from a therapeutical point, as all the Mahonias are bitter, and seem to contain *berberin* in nearly the same proportion. The root of B. Aquifolium is from one-half of an inch to an inch in diameter, often increasing to two and three inches at the base of the stem. It is woody, yellow throughout, and very hard. The bark is deep yellow beneath, and brown upon the surface. The presence of berberin renders both root and bark bitter. It also contains a white alkaloid, which forms soluble salts with most acids, itself being insoluble in water, soluble in hot alcohol, and slightly so in cold alcohol. The roots of the other species of Mahonia are smaller; the B. pinnata more nearly approaching the B. Aquifolium in size; the B. repens is the smallest of any of the known species.—L.

Properties and Uses—This agent has been extolled as an alterative and tonic, and has been recommended in syphilitic affections, salt-rheum, pityriasis, psoriasis, and other cutaneous affections, as well as in maladies supposed to be due to some mal-condition of the blood. As the plant contains considerable berberin, any efficacy it may possess in influencing these diseases, is undoubtedly due to its action as a tonic. Possibly, as with hydrastis, and other plants yielding berberin, it may possess other and more valuable therapeutical constituents, but no satisfactory analysis of it has been made. As a tonic, it may be employed

[1] A pamphlet by C. G. and J. U. Lloyd, 1878.

as a synonym of hydrastis, colombo, berberis, etc., in dyspeptic conditions, chronic mucous maladies, and in certain enfeebled conditions of the system, etc. The dose of the fluid extract is from ten to twenty drops every three or four hours.—K.

BOLDUS.

Nat. Ord.—Monimiaceæ. *Tribe.*—Hedycaryeæ, *D.C.*

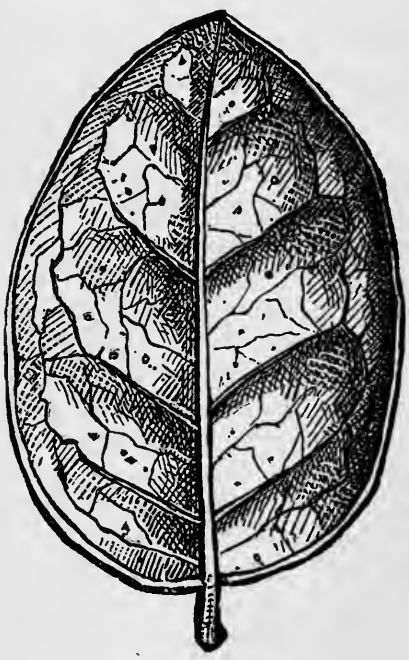
The leaves of Peumus Boldus, *Molina.* (*Syn.*—Boldoa fragrans, *Gay.*)

Common Name.—Boldo or Boldu.

ILLUSTRATIONS.—*Bot. Reg.*, Plate 57; *Bentley* and *Trimen*, *Med. Plants*, 217; our Fig. 4.

Description.—Peumus Boldus[1] is an evergreen fragrant shrub, from fifteen to twenty feet high, and native of the mountainous regions of Chili. The *leaves* are opposite, coriaceous, and on leaf-stalks about one-quarter of an inch in length. The *flowers* are in loose, terminal, dicœcious cymes, of about a dozen flowers each, on slender, pubescent pedicels. The *petals* are generally seven, strap-shape, and about half an inch long; of a light-yellow color, and somewhat twisted. The *male flower* has numerous recurved *stamens*, with slender *filaments*, which are hairy at the base. The *fruit* is a small orange-green, one-seeded drupe, which is aromatic and edible. The leaves (*Fig.* 4), as found in commerce, are thick, firm, of a light-green color, and covered with numerous glandular points on the upper surface. They are about two inches long, two-thirds as wide, and oval or elliptical in outline; have a rounded base, and a very obtuse apex. The edges are entire, and slightly recurved. The veins are pinnate, and prominent on the under side of the leaves. The odor of the leaves somewhat resembles that of wormseed, and the taste is nauseating and disagreeable.

Fig. 4.



Peumus Boldus.
Full size of leaf.

History.—In 1782, Molina described this shrub, under the name *Peumus boldus*; in 1794, Ruiz and Paron described the same plant under the name *Ruizia fragrans;* in 1809, Jussieu classed the plant under the name of *Boldoa fragrans;* finally, in 1869, M. H. Baillon presented a complete history of the plant, under the name *Peumus boldus*, which name it still retains. Boldo was introduced to the profession by Dujardin, Baumetz, and C. L. Verne, about 1872, and in the same year, E. Bourgoin and C. Verne obtained from the leaves a volatile oil, and an alkaloid to which the name *boldin*, or *boldina*, was given. The plant also contains essential oil, citric acid, lime, sugar, gum, tannin, and a

[1] *Botanical Register*, t. 57, and Bentley and Trimen, *Med. Plants*, 217.

quantity of thick, black, aromatic substances, probably due to oxidation of the oil; these constituents have no medicinal virtues.

The plant attracted but little attention until 1875, when Prof. Bentley exhibited it before the Pharmaceutical Society of Great Britain, and Dr. Miller brought it before the Philadelphia Pharmaceutical meeting. After this, some little demand was created for it, and even at exorbitantly high prices, small amounts were sold in this country. At present, the demand is limited, and the price is reasonable. The virtues of the drug, whatever they may be, are evidently derived from the essential oil and the alkaloid.

Boldin is obtained by extracting the leaves of the plant with alcohol, distilling the alcohol, and exhausting the residuum with acidulated water (acetic acid preferable), precipitating with ammonia, and purifying by solution in ether. It is a tedious operation to obtain the pure alkaloid. Boldin is crystallizable, soluble in alcohol, ether, chloroform and benzine. The dilute acids dissolve it, from which solution, ammonia in slight excess, precipitates the alkaloid as an amorphous mass. It is sparingly soluble in water, to which it imparts a bitter taste, and gives an alkaline reaction. Nitric and sulphuric acids yield a red color when boldin is added to them. The best agent to extract the medicinal principles of the leaves is alcohol, and the addition of water to the menstruum even in small amount is objectionable.—L.

Properties and Uses.—Boldo was sent from Chili as an efficacious agent in hepatic diseases, but its effect appears to be that of a gentle diffusible stimulant, probably useful to a certain extent in gastric debility, incipient dyspepsia, anemic conditions, etc. In these cases the alcoholic solution is undoubtedly the preferable one. A wine, elixir, and syrup, have also been prepared, but they possess no advantages over the tincture, which may be used in doses of from five to twenty drops in some agreeable vehicle. One part of the leaves to five parts of alcohol, at sixty per cent., forms a deep-red, bordering a little on green, bitter tincture. Boldin may be given in doses of from one to five grains. The essential oil, in doses of from three to five drops, in capsules, has been recommended in subacute inflammations and catarrh of the urinary passages; but it certainly possesses no superior advantages over turpentine, copaiba, and other resinous balsams. A very moderate use of the oil will, in a few days, impart the strong odor of the leaves to the urine, which fluid will redden under the action of dilute sulphuric acid.—K.

BRYONIA.

Nat. Ord.—Cucurbitaceæ. *Tribe.*—Cucumerineæ.

The root of Bryonia dioica, *Jacq.* (*Syn.*—B. alba, *Hudson*) and Bryonia alba, *Linn.*

Common Name.—Bryony.

ILLUSTRATIONS.—*Woodville's Med. Bot.*, Plate 187.

Description.—The species used in medicine are Bryonia dioica and Bryonia alba. The genus to which they belong is a family of herbaceous vines, climbing by means of tendrils. The species, of which there are about fifty, are found in most parts of the Old World. They are distinguished from the allied plants of the natural order Cucurbitaceæ, by having the *flowers* monœcious, or occasionally dicœcious, the five *stamens* united into three bundles, the *fruit* globular and berry-like.

Bryonia dioica belongs to the section of the genus Bryonia, with palmately lobed leaves. It is common among the hedges and in the borders of woods in Europe, especially in the calcareous soil of some parts of England, where it is quite ornamental. The *stem*, which is a rough annual, climbs to the height of several feet above hedges and undershrubs; the *leaves* are cordate and five lobed, the terminal lobe being longer than the others, and dissimilar. The *flowers* are of a light greenish-white color, with darker green veins; they are perfectly diœcious in the young plants, although both sexes are often found on older individuals. The *fruit* is a bright scarlet berry with several flat seeds.

Bryonia alba, is a closely related plant, found in Central Europe, Sweden, and Denmark It has white *flowers*, regularly lobed *leaves*, and black *berries*. These two species of Bryonia must not be confounded with the black bryony (*Tamus communis*), a European plant of the natural order Dioscoreaceæ.

Bryonia has been used in medicine throughout sections of Europe for a great many years, and occupies a conspicuous place in the *London Dispensatory*, published 1653. It is vulgarly known as *snakeweed*, *devil's turnip*, *parsnip turnip*, and *bastard turnip*. The root, the part employed, is from two to four inches in diameter, and about two feet in length, although occasionally larger. It is fleshy, and when wounded yields a milky juice. Internally it resembles the root of Phytolacca decandra, maintaining the similarity when sliced and dried.

As found in our market, Bryonia is in slices, often worm-eaten, or even decayed, and totally unfit for use. It is said that the purgative principle (Bryonin), is stable, but, undoubtedly, even though this be the case, it can not withstand the attacks of time and ravages of insects, for tinctures prepared from inferior specimens will not give satisfaction.

In 1858, G. F. Walz published an article upon the chemical composition of Bryonia alba (*Archiv. der Pharm.*, cxlvi), the result being the identification of two white crystallizable bodies, bryonin and bryonitin(?). Bryonitin, however, is not mentioned in Wittstein's organic constituents of plants. The root was extracted with alcohol and the alcohol evaporated; the extract obtained yielded to water the two (?) substances named, together with extractive matters. Bryonitin (?) may be, according to Walz, obtained by precipitating the aqueous extract with solution of basic acetate of lead, decomposing the precipitate with sulphide of hydrogen, filtering, evaporating the filtrate to dryness, then extracting the residuum with ether, and purifying by means of animal charcoal, and solution in boiling water, from which it crystallizes upon cooling. Bryonin, with impurities, remains in the residuum after extraction of the aqueous extract with ether, and may be obtained by dissolving the residuum in water, precipitating the coloring matter with acetate of lead, the excess of which must be removed with sulphide of hydrogen; after filtration, neutralize the filtrate with carbonate of sodium; then precipitate with tannic acid, dissolve the precipitate in alcohol, digest with hydrate of lime, filter, digest with animal charcoal, again filter, and evaporate. This process will also yield Bryonin, if followed with the aqueous solution of the evaporated alcoholic extract of the root. Bryonin, $C_{48}H_{80}O_{19}$, is colorless, very bitter, soluble in water and alcohol, and insoluble in ether; when boiled with dilute sulphuric acid it assumes a blueish tint, splits into sugar and two bodies named by Walz, *bryoretin*, soluble in ether, and *hydrobryoretin*, insoluble in ether.—L.

Properties and Uses.—The fresh root is extremely irritating, occasioning blisters, when bruised and kept in contact with the skin, and causing

serious gastro-intestinal inflammation when taken internally. A similar result follows the administration of large doses of the dried root. This root appears to have been well known to the ancients, and was used in various maladies. It has likewise been employed in more recent times in convulsions due to the presence of worms in the intestines, as a cathartic, in dropsy, and in cases of chronic inflammations, attended with glandular enlargements, or serous effusions. It is chiefly used, at the present day, as a remedy in chronic serous maladies, in glandular enlargements, in scarlatina, to lessen the tendency to aural complications that may terminate in otorrhea and deafness; in chronic orchitis, in chronic rheumatic affections, and, in small doses, to overcome constipation, and regulate the bowels. As the root deteriorates by age, the better form for therapeutical use is the tincture, or some alcoholic preparation. The dose will vary according to the strength of the preparation; of the ordinary tincture, it will be from one to three drops, repeated every three, four, or five hours, as required.—K.

CALCII BROMIDUM.

BROMIDE OF CALCIUM.

Formula, $CaBr_2$; molecular weight, 199.40.

Preparation.—This salt may be formed by the direct union of calcium and bromine, and also by decomposition of bromide of sulphur with lime. In 1872, Mr. J. R. Mercein recommended that it be prepared from hydrobromic acid and carbonate of calcium; hydrobromic acid being first made by passing sulphide of hydrogen through bromine beneath water, and then the carbonate of calcium to be subsequently decomposed with this solution. Afterward, in the same year, Mr. George MacDonald suggested that bromide of ammonium be decomposed with caustic lime, but, owing to the fact that an excess of lime is necessary, in practice, to decompose the last part of the ammonium bromide, and that an excess of lime forms an *oxybromide* of calcium, we favor its preparation from hydrobromic acid and carbonate of calcium, as follows:

Take any convenient quantity of solution of hydrobromic acid, place it in a porcelain evaporating-dish capable of holding four times the bulk, and then add carbonate of calcium, with stirring, as long as effervescence continues, then warm it, filter, and evaporate the filtrate to dryness.

History.—Bromide of calcium is a white granular powder. By evaporation from its aqueous solution, silky needles form, which, according to Watts, are a hydrated bromide. The dry salt is deliquescent and very soluble in alcohol and water. In many respects it resembles calcium iodide and calcium chloride.

The *impurities* more apt to be encountered in this salt, are, hydrate of lime and a basic bromide (oxybromide). Either may be separated by dissolving the salt in alcohol, and then filtering, as these impurities are insoluble in alcohol. Other substances, such as chlorides, nitrates, bromates, etc., are not likely to occur in any considerable amount.—L.

Properties and Uses.—The attention of the profession was directed to bromide of calcium, in 1871, by Dr. W. A. Hammond, as a sedative and hypnotic in certain nervous maladies, in lieu of bromide of potassium and other bromides. He has found it beneficial, acting promptly, in cases of delirium, insomnia due to business anxieties, or intense mental

labor or excitement; in exhausted and irritable conditions of the nervous system, as indicated by headache, vertigo, wakefulness, etc., so frequently observed among hysterical women; in epilepsy occurring in very young infants, that resisted the bromide of potassium. He has likewise derived advantage from its use in cerebral congestion, both the active and passive forms, and in locomotor ataxia. It is much more prompt in its action than the other bromides. Its dose is from fifteen to thirty or more grains for an adult. He has given the following as an eligible formula: Take of bromide of calcium one ounce, syrup of lactophosphate of calcium four fluidounces, mix. The dose of this solution is a teaspoonful in a little water, to be repeated three times a day. This bromide will be found useful in nearly all cases in which the other alkaline bromides are indicated, in most instances acting more promptly, with greater efficiency, and with less tendency to acneiform eruptions.—K.

CALCII MONOSULPHIDUM.

MONOSULPHIDE OF CALCIUM. SULPHIDE OF CALCIUM.

Formula, CaS; molecular weight, 71.88.

Preparation.—This salt is usually called calcii sulphidum, or sulphuret of lime, CaS. It is obtained by heating sulphate of calcium with powdered charcoal; by passing a mixture of carbon dioxide and the vapor of carbon disulphide over incandescent lime (Schone); or, by calcining calcium monoxide (lime) or calcium carbonate, with powdered sulphur. In the latter case calcium sulphate is also formed. The following, from *Wittstein*, produces an excellent article: "Three parts of finely powdered crystallized sulphate of lime (native gypsum), are intimately mixed with one part of finely powdered wood charcoal, the mixture is well pressed into an earthen or black lead crucible, covered with a thin layer of charcoal powder, and then the cover luted, with the exception of a very small opening on the top; when the luting is dry, heat is applied, at first gently, and afterward strongly, in a good wind-furnace for at least one hour. When cooled, the crucible is removed from the fire, the upper portion of its contents taken off, the remainder powdered in a mortar, and kept in a well-closed vessel. The yield is nearly one and a half parts."

History.—Pure calcium monosulphide forms a white mass, almost insoluble in water, to which, however, it gives an alkaline reaction and hepatic taste. As usually prepared, it inclines toward a gray or red tint, from iron or manganese contained in the materials, or (gray) from the presence of unconsumed charcoal. In moist air it is slowly decomposed, evolving sulphide of hydrogen. Upon adding it to dilute hydrochloric acid, sulphide of hydrogen is liberated, together with carbon dioxide, if calcium carbonate be present. The final result of the action of the atmosphere is complete decomposition of the calcium monosulphide, with formation of calcium carbonate ($CaCO_3$), calcium sulphate ($CaSO_4$), and free sulphur. It is essential, therefore, that the salt be either freshly prepared, or else very carefully preserved in glass-stoppered bottles, which should be nearly filled—L.

Properties and Uses.—Monosulphide of calcium, in order to be of therapeutical value must possess the odor peculiar to sulphides, which is very similar to that of rotten eggs. This remedy has been found effi-

cacious in boils, carbuncles, suppurating scrofulous ulcers in the neck, scrofulous sores, soreness of the throat with glandular enlargement, occuring in measles or in scarlatina, enlarged testes, indolent buboes, acne, mammary abscess, anal fistula, etc. Its influence on the suppurative process, as stated by Professor S. Ringer, is as follows: A thin, watery, unhealthy discharge, becomes, at first, more abundant, then diminishes, and becomes thicker, and healther, like "laudable" pus, the condition of the sore improving correspondingly, and its healing being promoted. In some cases, any pain that exists is temporarily aggravated, but, as the rule, it is speedily mitigated. The general health improves, and the debility and malaise, so frequently attending these maladies, promptly passes away. In cases where inflammation and severe pain are present, he advises the smearing of the parts with a mixture of equal parts of belladonna extract and glycerin, covering this with a small poultice, at the same time protecting the surrounding skin from the tendency of the poultice toward the production of a fresh crop of boils, etc., by the application of a piece of leather with a hole in it large enough to contain the boil or affected portion. The dose varies from one-tenth grain to one-half grain, every two or three hours, and the treatment requires to be continued for several weeks. Ordinarily one-sixth of a grain rubbed up with two or three grains of sugar of milk, will be a sufficient dose. Dr. S. Sexton, of New York, has derived much benefit from sulphide of calcium in cases of furuncular inflammation of the external meatus auditorius, when suppuration was threatened, or had already occurred. Dr. Solomon, of Birmington Hospital, England, has found the sulphide of calcium efficacious in cases of chronic vascular keratitis (strumous), when accompanied with cold extremities and other indications of impaired circulation; he dissolves one grain of this sulphide in half a pint of water, and administers the solution in doses of from one to four fluidrachms, repeated every two, three, or four hours. In acute cases, he has found it injurious, and, in patients of a sanguine temperament, it acts as a stimulant. In doses of one-eighth of a grain rubbed up with three grains of sugar of milk, and repeating the dose three or four times daily, this agent is reported to have been successful in the treatment of diabetes; but further experiments are required before much confidence can be placed in this statement. Larger doses of the monosulphide of calcium than those stated above, are apt to derange the digestive functions; with children they should be less.—K.

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CALCII SULPHIS.

SULPHITE OF CALCIUM.

Formula of Anhydrous Salt, $CaSO_3$; molecular weight, 119.76.

Formula of Crystallized Salt, $CaSO_3 + 2H_2O$; molecular weight, 155.68.

Preparation.—Sulphite of calcium may be made by mixing a solution of a normal sulphite with solution of a salt of calcium. Also, by making a thick paste with slaked lime and water, spreading in thin layers, and passing sulphurous acid gas over it until absorption of the gas ceases. This latter is the process employed upon a large scale.

History.—This salt is a white powder of a weak, sulphurous taste, and is known in commerce as *sulphite of lime.* It is soluble in eight

hundred parts of water, and freely soluble in solution of sulphurous acid, without effervescence. If effervescence ensues, carbonate of calcium is present as an impurity. When the solution in sulphurous acid is exposed to the atmosphere, the acid escapes, and six-sided needles of the composition $CaSO_3 + 2H_2O$ separate. Sulphite of calcium is chiefly consumed by cider-makers, as the addition of a small amount retards or checks vinous fermentation. For this purpose it is customary to permit fermentation to progress until the cider is of the desired quality, then to add to it sulphite of calcium in the proportion of four or six ounces to the cask of forty gallons of cider, then agitate well, permit the turbid liquid to settle, and afterward, as desired, draw off the clear cider. The impurities that may be expected to exist in sulphite of calcium are such as are contained in the lime from which it is prepared, as, carbonate of calcium from previous exposure of the slaked lime to atmospheric action, and sulphate of calcium, both in varying proportions. The latter substance is gradually produced when sulphite of calcium is exposed to the atmosphere.

The solution of sulphite of calcium in sulphurous acid water is known in commerce as *bisulphite of lime* and is produced by passing sulphurous acid into milk of lime. It is a clear liquid of a suffocating sulphurous odor, and is said to be used by brewers for the purpose of giving stability to beer (*Roscoe* and *Schorlemmer*), and is occasionally employed by fruit preservers, in small proportion, for the purpose of preventing fermentation in canned fruit.—L.

Properties and Uses.—Sulphite of calcium and "bisulphite of lime," possess properties similar to other sulphurous acid preparations, being disinfectant and antiseptic. They are mostly employed for the purpose of checking fermentation in fluids liable to undergo such action. They are rarely employed in medicine, except, occasionally, to disinfect and stimulate obstinate ulcers of long standing. For internal use, there are several other sulphites before the profession, that are preferred.—K.

CAMPHORA MONOBROMATA.

Monobromated Camphor.

Formula, $C_{10}H_{15}BrO$; molecular weight, 230.41.

History.—Camphor unites directly with bromine in the cold without evolution of gas, forming bibromide of camphor ($C_{10}H_{16}OBr_2$), which was discovered by Laurent in 1840. This compound is unstable, being decomposed even by the atmosphere. In 1861, Th. Swarts found, that when bibromide of camphor is heated in sealed tubes, decomposition ensued, resulting in the formation of hydrobromic acid and a compound, in which one atom of hydrogen of the camphor molecule is replaced by an atom of bromine, thus, $C_{10}H_{16}OBr_2 = C_{10}H_{15}OBr + HBr$. It was also shown that camphor and bromine heated together for three hours in sealed tubes, would accomplish the same result, and doubtless, in this instance also, bibromide of camphor is first formed. In 1865, W. H. Perkin, independent of former investigators, prepared monobromated camphor while experimenting upon Laurent's bibromide of camphor, and named it bromo-camphor. *Journ. Chem. Soc.*, 1865.

Monobromated camphor was first experimented with, as a therapeutical agent, by Professor Deneffe of Ghent. In 1872, an article in its favor, appeared in the *N. Y. Med. Journ.*, May, p. 522, from W. A.

Hammond, M. D., and from this time numerous articles in the various medical journals created a demand for it.

Preparation.—The fact that sealed tubes were unnecessary for the practical preparation of the article, was shown by Professor Maisch, in the *Am. Journ. Pharm.*, August, 1872. The writer recommends the following process, which varies somewhat, in certain respects, from that by Professor Maisch, as one which he has employed quite extensively in laboratory work: Take of camphor, in small pieces, fifteen troy ounces; cold bromine sixteen troy ounces. Place the camphor in a tubulated retort, of not less than one-half gallon capacity, and connect the exit, by means of a rubber tube, with a glass tube extending into ammonia water; then, through a funnel, pour upon the camphor four troy ounces of the bromine. As soon as the temperature begins to rise, stop the tubulure of the retort, and occasionally agitate the contents. The mixture will partially liquefy, and the temperature will increase spontaneously, with evolution of gas, until about 160° F. is reached; from which point the heat must be continued by means of a steam or water bath to 200° F. The flow of gas will now cease, and the stopper of the retort must be immediately removed, in order to prevent the ammonia being drawn into the retort by absorption of hydrobromic acid and the contraction of the cooling gas. When the contents of the retort have become cool, cautiously pour into it four troy ounces of the bromine, care being taken that the contraction caused by the bromine vapor coming into contact with the gas within the retort, followed by subsequent expansion, does not throw a part of the bromine upon the operator. Now repeat the preceding operation, and when the reaction ceases, cool as before. In like manner, add the remainder of the bromine in successive portions of four troy ounces, raising the temperature, as in the previous instances, to 200° F., after each addition. Lastly remove the stopper, and permit the contents to cool to about 50° F., and remain for twenty-four hours, when there will be a mass of crystals formed. Invert the retort, and permit the thick liquid to drain from the crystals; then pour upon them sixteen fluidounces of alcohol, and dissolve by means of a gentle heat and agitation; then decant the solution into an evaporating basin, and cool gradually, when crystals of monobromated camphor will separate; these should be purified by dissolving again and recrystallizing from their solution in sixteen fluidounces of hot alcohol. The yield will about equal the weight of the camphor employed.

RECAPITULATION.—When bromine is added to camphor without access of air, combination ensues, with liberation of heat and formation of a portion of bibromide of camphor. If the temperature be retained at about 50° F., by means of ice, no decomposition of bibromide follows. According to our experience, after the addition, each, of the first and second portions of four ounces of bromine, in the foregoing process, decomposition of the bibromide ensues when the temperature reaches 155° F. After the third and fourth respectively, at 110° F., attended with evolution of hydrobromic acid and a gas insoluble in water. The hydrobromic acid results, as before explained, from the decomposition of bibromide of camphor, an atom of bromine replacing an atom of the hydrogen of the camphor molecule; the liberated hydrogen and bromine atoms uniting to form a molecule of hydrobromic acid. By-products are generated also by other reactions, so that the theoretical amount of monobromated camphor is never obtained. It is not advisable to permit the temperature, at any time during the reaction, to

exceed 200° F., as the reduction of the bibromide will have occurred at this point, and when too great a heat is employed volatilization of the contents of the retort ensues, and, to some extent, destructive decomposition, with formation of a black oil (perhaps containing finely divided carbon) difficult to remove from the crystals. The addition of water (J. U. Lloyd, *Am. Jour. Pharm.*, 1875), is objectionable. The hydrobromic acid forms bromide of ammonium with the ammonia water, and this salt may be obtained by evaporating the solution of ammonia after the reaction.—L.

Properties and Uses.—Monobromated camphor was first introduced to the profession, as a sedative to the nervous system, by Prof. Deneffe. M. Bourneville, who experimented with it upon different animals, as cats, rabbits, guinea pigs, and frogs, concluded from the results obtained that this article diminished the number of pulsations and determined a contraction of the auricular vessels; that it diminished the number of inspirations; reduced the temperature in a regular manner, and that it possesses undeniable hypnotic properties, appearing to act principally upon the cerebral system. Its continued use, at least with cats and guinea pigs, determines a rapid emaciation. The diseases in which it has been extolled as efficacious, are certain forms of mental alienation with excitation, chorea, paralysis agitans, fevers, and acute diseases, hysteria, delirium tremens, convulsions of children, especially when due to dentition, insomnia, satyriasis, nymphomania, spasm of the glottis, palpitation of the heart, pertussis, headache, and dyspnœa of asthmatic or cardiac origin. It is likewise stated to have proved beneficial in spermatorrhea accompanied with great nervous excitability. M. Lannelongue has prescribed it with benefit in painful cystitis, when the pain is not the result of any organic lesion, neuralgic cystitis. Also in cystitis of the neck of the bladder, of congestive origin and associated with a vascular lesion of the neck the result of various causes; if vesical catarrh be combined with the cystitis, its effects will be nearly null. If the vesical catarrh be slight, even when a more or less acute prostatitis is associated with the inflammation of the vesical neck, its effects will be well marked. The dose of monobromated camphor is from three to thirty grains per day, in form of pills, dragees, or elixir. An elixir has been proposed as follows: Take of alcohol, ninety per cent., four fluidounces, glycerin three fluidounces and three fluidrachms, water two and one-half fluidounces; mix together, and then add monobromated camphor forty-six grains. Gently heat the mixture until the camphor is dissolved.

While many experimenters have highly praised this agent as a successful remedy in the affections above referred to, many others have repudiated it as being much less efficacious than the alkaline bromides. This discordance of opinions, together with its disagreeable taste, may prevent its coming into general use.—K.

CAPSELLA BURSA PASTORIS.

Nat. Ord.—Cruciferæ. *Tribe.*—Lepidineæ.

The dried plant of Capsella Bursa-pastoris, *Mænch.* (*Syn.*—Thlaspi Bursa-pastoris, *Linn.*)

Common Name.—Shepherd's Purse.

ILLUSTRATION.—Our Plate, No. V.

Description.—This is an annual weed, native of Europe, but natural-

izes in almost every country of the world. In the United States it has become among the most common of yard weeds, growing in all sections of the country, and often forming large patches in waste grounds. It is especially luxuriant in the spring months, but the stem dies and the weed entirely disappears by the middle of summer. The *stem* is erect, striate, about twelve inches high, where the plants grow apart, but in rich soil, where they are in patches, the stems are often over two feet long and reclining, but the thickness is increased very little. The *branches* are few, remote, and generally simple. The *leaves* are mostly borne in a thick radical cluster, at the base of the stem, and recline on the ground. They are from three to six inches long, and pinnatifid, with from nine to fifteen acute wedge-shaped segments. The stem-leaves are few, shorter than the internodes, and clasp the stems at the base of the branches. The lower stem leaves are sagitate and dentate, the upper, linear and entire. The *flowers* are small, white, and borne in terminal racemes, which elongate as the flowers expand. The *sepals* and *petals* are four, and the *stamens* are six and tetradynamous. The *fruit* is a flat wedge-shaped pod, notched at the end, and divided by a narrow partition, into two cells, which contain numerous minute oblong seed.

Lepidium Virginicum, *Linn.*, pepper-grass, an allied weed found in similar locations, has often been confounded with Capsella, and has been lately figured for it in one of the medical journals. Pepper-grass has an erect, *much-branched* stem, about a foot high. The leaves are numerous and much more toothed than the stem leaves of Capsella. The fruit is an *orbicular*, flattened pod, divided into two cells by a narrow partition, and containing two rather large seeds. Pepper-grass has a much sharper and pungent taste than Capsella.

Capsella Bursa Pastoris has been used in domestic medicine since an early day. Culpepper refers to it in his *English Physician*, and the article is copied almost verbatim in subsequent works, until Lewis' (1761) *Materia Medica* cast discredit upon it as an astringent. Shepherd's purse has an herbaceous, unpleasant odor when fresh, if bruised, and a pungent, biting taste which is lost by drying. The herb contains a resin and a volatile oil; the seeds yield proteinous substances, a fixed oil, and a volatile oil said to be identical with the volatile oil of mustard. But no satisfactory analysis has yet been made of its chemical constituents.—L.

Properties and Uses.—Shepherd's purse appears to possess mild stimulating, astringent, and diuretic properties, and the fresh herb is decidedly more active than the dried. In urinary derangements, of renal or cystic origin, and in hematuria, an infusion, and especially a tincture of the herb, will be found very efficacious. It has likewise been used with some success as an expectorant, and for the promotion of the catamenial flow in cases of simple amenorrhea. In bleeding piles, diarrhea, and dysentery, it is stated to have been found beneficial. The dose of the infusion is from two to four fluidounces; but its best form for administration is a tincture or fluid extract of the herb; the dose of the tincture is one or two fluidrachms every two or three hours; of the fluid extract, from twenty to sixty minims. The fresh herb, bruised and applied locally, has been efficacious in ecchymosis the result of blows, bruises, etc., and has been of service in rheumatic pains.—K.

CAPSELLA BURSA PASTORIS.

CARBONEI DISULPHIDUM.

DISULPHIDE OF CARBON. BISULPHIDE OF CARBON.

Formula, CS_2; molecular weight, 75.93.

Preparation.—Carbon forms two compounds with sulphur, a disulphide and a monosulphide; the former alone is of use in medicine or the arts. The latter is a recent discovery, and is obtained by exposing the disulphide in sealed tubes to the sun's rays. Lampadius, in 1796, discovered carbon disulphide accidentally, while heating iron pyrites with charcoal, and, in 1802, Clement and Desormes obtained it by heating charcoal and sulphur. It is prepared upon a large scale by passing the vapor of sulphur over red-hot charcoal, in which case an impure carbon disulphide distils and is collected in a cooled receiver beneath water. This crude article is always impure, containing dissolved sulphur and several sulphur compounds, which impart an offensive odor to the commercial article.

PURIFICATION.—Formerly, it was purified by repeated distillations from oil or fat, but, at present, the impure carbon disulphide is at first agitated with mercury until it ceases to blacken the bright surface of the metal, and then it is distilled from white wax; or, it is allowed to remain a long time in contact with corrosive sublimate, or litharge, with frequent agitation, and is then distilled from bleached wax. M. Yvon, of Alfort, proposes the addition of copper turnings to the disulphide, in order to deodorize it, stating that it is not necessary to agitate it; the disulphide soon loses its offensive odor and gives out an ethereal odor, free from all unpleasantness.

History.—Pure carbon disulphide is a colorless liquid, and possesses strong refractive and dispersive powers. Its odor is sweetish, ethereal, somewhat resembling chloroform or anise oil. When of a penetrating, alliaceous, fetid odor, it is not pure. Its taste is burning and somewhat acrid. Its specific gravity at 0° C. (32° F.), is 1.292 (*Thorpe*), and boiling point 46° C. (114°.8 F.). According to Faraday, it does not solidify at —110° F. It is very inflammable, burning in the air with a bright-blue flame, the resulting compounds being carbon dioxide and sulphur dioxide. Its vapor, mixed with nitric oxide, burns with a bright-blue flame, and when mixed with oxygen or atmospheric air, the mixture explodes with great violence when inflamed. It evaporates so rapidly in the open air as to determine the condensation and congelation of the water contained in the air; when evaporated in vacuo, a cold of—60° C. may be obtained. It freely dissolves such bodies as essential oils, sulphur, phosphorus, iodine, bromine, camphor, gutta-percha, caoutchouc, fats, wax, etc., and alkaloids that are usually soluble in ether. It is insoluble in water, but soluble in alcohol, ether, and fats; its alcoholic solution becomes very readily changed, but if some essential oil of mint be added to it, it prevents its decomposition, and lessens any unpleasant odor. Under the action of the solar rays it assumes a yellow color. It is poisonous, and its vapor destroys small animals exposed to its action. When inhaled for some time, even in very small amount, it produces serious effects upon the nervous system. According to Zoller, meat is preserved in an atmosphere which contains its vapor. It is used largely in various branches of the arts, as in india-rubber and woolen factories; and recently, large quantities have been manufactured in this vicinity (Cincinnati), for distillers, who, it is said, employ it to separate the corn oil from the ground grain before it has undergone fer-

mentation. In Europe, carbon disulphide has been employed in the process of the extraction of organic alkalies to eliminate the fats, resins, chlorophylle, etc., present; to extract croton oil, bay oil, butter of cocoa, butter of nutmegs, oil of male fern, oil of spruce-fir, etc.; to extract the fat from wool, bones, etc.; to manufacture soluble spices; to purify paraffin; to destroy certain noxious insects and animals; to preserve meats, fruits, etc.; to extract sulphur from certain minerals; also in the preparation of Greek fire. It forms no solution with water, and advantage has been taken of this fact to determine the amount of moisture in commercial iodine. Berzelius found that it unites with metallic sulphides to form salts called *thiocarbonates* or *sulphocarbonates*, in reality salts of *thiocarbonic acid*, H_2CS_3, which is some times called sulphocarbonic acid. These salts have the composition of carbonates, with the exception that the oxygen is replaced with sulphur. Carbon disulphide combines with the derivative of alcohol *triethylphosphine* $P(C_2H_5)_3$, to form a solid which crystallizes in beautiful red crystals $P(C_2H_5)_3CS_2$. Carbon disulphide, for medicinal use, should not possess a repulsive odor; the fetor of the commercial article, as we have said, is owing to its impurity. It should likewise be neutral to litmus paper, and should not blacken mercury nor (*Hoffman*) precipitate a solution of plumbic acetate when agitated with it. As frequent contact with air occasions its deterioration, carbon disulphide, for medicinal use, should be placed in small, well-stoppered bottles, and kept in a cool place; it should not be handled nor poured out in the vicinity of flame.—L.

Properties and Uses.—Disulphide of carbon was first used as an anesthetic, in 1848, by M. Harald Taulow, of Christiana, Norway. Subsequently, Dr. Simpson, of Edinburg, confirmed the fact of its anesthetic properties, and published his experiments to the profession. (*Pharm. Jour.* vii, p. 517.) Its unpleasant odor, the disagreeable symptoms following its inhalation, as frequent pulsations, headache, vertigo, emesis, and annoying visions, together with its brief anesthetic influence, have proved objections to its becoming in general use. Inhalation of air saturated with the vapor of the disulphide has been found injurious, as observed in manufactories where it is employed for dissolving caoutchouc. The symptoms resulting from such inhalation have been described, by those medical men who have investigated this point, as follows: Headache, vertigo, wakefulness, impairment of the mental faculties, over-excitement of the nerves, neuralgic pains, cramps, bluntness of the senses of touch, sight, and hearing, impotency, derangements of the digestive functions, dyspnœa, palpitation, debility, emaciation, and, occasionally, delirium. The period of excitation will be manifested in various ways, by vehement laughter, boisterous talking, rambling singing, weeping, etc. Mansfield, Wurtz, and others, have advised its internal use, in doses of two drops in milk, or in sweetened water, repeated every two hours, as an emmenagogue; it has also been proposed as a stimulant and sudorific in rheumatic and gouty affections, and in certain cutaneous maladies, but the uncertainty of its effects, and the serious symptoms apt to follow the ingestion of even a few drops, as intense burning sensation in the mouth and fauces, sickness at stomach, emesis, gastralgia, flatulency, and difficult micturition, will, undoubtedly, prevent its general use as an internal therapeutic agent. Dr. J. T. Whittaker, has reported to have found its internal administration of considerable efficacy in the treatment of carcinoma, and especially that of the stomach; he administered it in doses of two drops in alcohol or almond oil, repeated every two or four hours. Although not curing

the disease, it promptly mitigated the severe symptoms, improved the health and strength, and prolonged the life of his patients.

Its application, externally, has been found of great value in certain diseases. Its vapor, directed through a tube upon the eye, or upon the outer surface of the drum-membrane, for a few seconds, or until a glow of heat is experienced, acts as a stimulant and promotes absorption in the parts; employed in this manner, it has proven efficacious in deafness due to deficient nerve power, lack of cerumen, in purulent discharges from the meatus auditorius, in tinnitus due to indurated cerumen with dryness of the canal, and in eczema of the ear; also in chronic inflammation of the conjunctiva, ulceration of the cornea, lachrymal suppression, muscæ, sclerotitis, and in scrofulous ophthalmia, phlyctenular formations, etc. In neuralgia, lumbago, and other painful affections, benefit will often follow the application of the disulphide, on cotton or on a compress, over the painful parts; it should be allowed to remain in contact until a smarting sensation is produced. When it occasions pain, as will sometimes be the case, the vapor may be directed upon the part, instead, and be continued until the smarting sensation is complained of. If the disulphide be sprayed upon the part, allowing it to evaporate from time to time, before a renewal of the spray, in a few minutes local anesthesia will result, pain will be relieved, and, if necessary, deep incisions may be made without any pain being felt. In this manner, it will likewise frequently be found useful in goitre, lupoid growths, glandular enlargements, and indolent tumors. In many of the maladies just referred to, the efficacy of the remedy may be increased by the addition of iodine to the disulphide.

In atonic wounds and chronic ulcers, its local application has proven very beneficial, as well as in ulcerations of a scrofulous or syphilitic character. A camel's hair pencil, or a pledget of lint, moistened with the fluid, is quickly and lightly passed over the surface of the wound or ulcer, which may then, if necessary, be immediately covered with a layer of finely pulverized subnitrate of bismuth or starch. This may be repeated once every one, two, or three days, according to the degree of inactivity of the ulcer. Its application is followed by intense pain, which, however, does not last longer than from twenty seconds to three or four minutes. Applied to ulcers of the cervix uteri the pain continues but a few minutes, while that produced by other agents, as, for instance, acid nitrate of mercury, frequently continues for many hours. The pain gradually becomes less and less with each application, and as the cicatrizing process becomes confirmed, it diminishes and disappears. Dr. Dorring considers it by far the best local application known, at the present day, for indolent ulcers. This fluid has also been applied in the form of a liniment, composed of one part of the disulphide to four parts of olive oil; also an ointment in parasitic cutaneous diseases, consisting of one part of the disulphide to four or eight parts of lard. These should be kept in well closed vessels.

Insects, frogs, lizards, dissected or not, and parts of animals, suspended from hooks, or deposited upon perforated shelves, may be preserved indefinitely in a perfectly air-tight vessel containing five drops of disulphide of carbon for every quart of air-capacity. Strawberries, raspberries, cherries, beans, currants, cucumbers, peaches, radishes, etc., may be completely preserved in the same way, the only change noticeable being a fading of the color, and an exudation of juice from the berries. A short exposure to the air on removing these articles from the vessel, will render them fit to eat, and with a flavor the same as

when fresh. The preservative powers of this fluid are chiefly due to its coagulation of albuminoids and its lessening the quantity of free water in the article preserved in it.—K.

CARICA PAPAYA.

Nat. Ord.—Passifloreæ. *Tribe.*—Papayaceæ.

Common Name.—Papaw, Pawpaw, Mamæiro.

ILLUSTRATIONS.—*Bot. Reg.*, Platè 459; *Bot. Mag.*, 2898 and 2899.

Description.—Carica papaya is a tree indigenous to South America, where it is met with in its wild condition, as well as under cultivation, and varies in height, according to its wild or cultivated state, from five to thirty feet, and about a foot in diameter. (*Rees' Cyclopœdia.*) The trunk or stem is simple, erect, without branches, and gradually tapers from the base to the summit, where it terminates in a cluster of leaves, after the manner of a palm; its entire length is thickly covered with the scars of the fallen leaves. The *leaves* are large, alternate, close together, palmately divided into from five to seven irregularly cut lobes, and are borne on leaf-stalks a foot or two in length, and which are peltately attached. The *flowers* are diœcious, rarely monœcious, and are grouped at the top of the trunk; the male flowers are borne on long peduncled racemes; the female flowers are solitary, and axillary on short stalks, and consist of a small five-parted calyx, five twisted, pale yellow petals and a large ovary, bearing five dilated, sub-sessile stigmas. The ovary is globular, one-celled, and contains numerous ovules attached to five parietal placentæ. As the ovary enlarges and develops, the leaves gradually fall off, and the fruit, when matured, appears suspended to the highest part of the smooth trunk.—L.

History.—The Carica constitute a family of phanerogamous plants, which grow in the East Indies and in South America, either in a natural state or cultivated. The following species have properties similar to those of C. papaya: *Carica spinosa* (*Well*), a native of the provinces of Pernambuco, Rio de Janeiro, etc.; and *Carica dodecaphylla* or *jaracatia*, a tree of high stature, with a trunk furnished with spines. When incised, this last gives a milky juice. Its fruit is smaller and longer than that of the Carica papaya.

The *Carica papaya* is cultivated throughout the greater part of Brazil, and its fruit bears some resemblance to that of the Cucurbitaceæ, especially to the genus *Cucumis*. The fruit, when ripe, is yellow, irregularly ovoid, with five rib-like projections; it is pulpy, enclosing numerous blackish seeds, and has a rather agreeable, sweetish taste. The root is said to have an odor resembling that of rotten cabbage. In Brazil, the common name of the plant is *mamœiro*, and the fruit is called *mamao*. The juice or milk proceeding from the bark or fruit is the part that has attracted attention. In 1850, Hœferk stated that the juice was milky, bitter, and possessed the property of an irritant poison, and that, when mixed with water, it was used to soften tough meats, by macerating them in the liquid. A. Pinto, A. Camara, and Martius have repeated nearly the same thing; and Pinto also remarks that it is used to render the skin of the hands soft, and to remove freckles from the face. In 1875, Dr. Roy, an English physician, instituted some experiments with the milky juice, and found that it had the property of soft-

ening and dissolving meats; a microscopic examination of the meats thus dissolved showed a complete disintegration of the muscular fibers, the fasciculi being dissociated, and the ultimate fasciculi in a fair way for separation. The entire fluid mass was swarming with vibriones. Other investigators have arrived at the same results.

The milk of *mamœiro*, whether had from the bark or from the fruit, is in so small an amount that a sufficient supply for instituting a regular chemical analysis can not be procured; the greatest quantity that has been obtained from a large number of trees and fruit is in all about one fluidounce. Another circumstance which antagonizes analysis and interferes with investigation of its physiological and therapeutical effects, is the extraordinary rapidity with which it enters into fermentation, and which commences a few seconds after its extraction. The seeds of the fruit contain a resinous acid, which is probably their active principle; Dr. T. Peckolt obtained it by treating the fresh seeds with boiling alcohol and hydrate of lime, and then separating it by means of hydrochloric acid. It forms a yellowish powder, possessing a pungent taste.

The active principle or ferment of Carica papaya, a true vegetable pepsin, has been termed *caricine*. Mauriac obtained it (from the leaves) by extracting the juice from those recently gathered and filtering it. To the turbid and yellowish-green filtrate, double its volume of absolute alcohol was added, and, gradually, a flocculent precipitate of caricine formed upon the filter, slightly greenish and amorphous. This may be purified by new solutions and precipitations, and then carefully drying at a temperature not to exceed 104° F. Caricine is obtained from the leaves in the proportion of four parts to one hundred. It is insoluble in alcohol, and perfectly soluble in distilled water. Nitric and hydrochloric acids, bicarbonate of soda, or of potassa, and caustic potash, have no action upon it. It may be employed as a solvent of albuminoid materials in certain forms of dyspepsia, and as an anthelmintic.

Properties and Uses.—Without entering into a description of the varied experiments that have been made with this milk of carica, and concerning which an excellent account is given by Dr. Moncorvo, of Rio de Janeiro, in his translation of an article in the Portuguese language, entitled, "Note on the Physiological and Therapeutical Action of *Carica papaya*," by Dr. E. Mauriac,—we will simply refer to the conclusions drawn therefrom. This substance exerts a real dissolving or digestive action upon nitrogenized substances; this action is likewise obtained with its aqueous solution, while its solution in alcohol appears to render it wholly inert. It has no action upon feculent substances. Applied upon the skin, it renders it softer and more smooth, and appears to destroy the projections formed at certain points by a greater or less thickening of the epidermis. Upon the skin deprived of its epidermis, and upon the subcutaneous cellular tissue, it has an extremely irritating action, provoking intense inflammation; and, in addition, the formation of abscesses, rapidly followed by a putrid infection when thirty grains were hypodermically injected, these symptoms being preceded by severe pain, moanings, and great difficulty of motion. Upon the digestive mucous membrane it acts as a caustic and corrosive substance, its effects being rapid, violent, and deep-seated, and occasioning energetic purgation. According to Desjardins, boiling removes these corrosive effects, and it then proves the most active vermifuge of the Materia Medica, in doses of a drachm or two mixed with an equal quantity of

castor oil, a single dose being sufficient to cause the expulsion of an astonishing number of the lumbricoids. The seeds possess an identical property, and will probably be found preferable for administration.

The chief property of the milk of the carica is its action upon food, similar to that of pepsin, exercising, like this latter article, a digestive influence upon albuminoid substances. But the difficulty of procuring and preserving a sufficient amount of it for therapeutical use, together with its deeply irritating action, will prevent it from coming into use as a remedy for dyspepsia or gastric affections. To overcome these obstacles, Dr. Mauriac instituted a series of experiments with the leaves of the tree, and found that a concentrated decoction of them exerted upon albuminoid substances an action analogous to that of the milky juice of the tree and of the green fruit, without any appreciable irritation of the gastric mucous membrane. This decoction must be administered in small doses. Dr. M., however, prefers *caricine*, the action of which does not appear to be interfered with by an acid or neutral condition of the stomach, and which, being more energetic than pepsin, must be given in smaller doses, and in aqueous solution.—K.

CASTANEA.

Nat. Ord.—Cupuliferæ.

The leaves of Castanea vesca (*Gært*), *var.* Americana (*Mich'x*), gathered when mature and dried in the shade. (*Syn.*—Castanea vesca, *Mich'x* (*Sylv.*, Vol. III, p. 11.) Fagus Castanea, *Linn.*)

Common Name.—Chestnut.

ILLUSTRATIONS.—*Flora of New York*, Plate CXI. *Mich'x Sylv.*, Vol. III, Plate 104. *Emerson's Trees of Mass.*, p. 187.

Description.—The chestnut is a large tree, originally a native of Asia Minor, but introduced and extensively naturalized in the temperate parts of Europe. The American tree (*var.* C. Americana, *Mich'x*) differs slightly from the European, in having smaller fruit, and leaves acute at the base. It is found from Maine to the Gulf States, being especially abundant in the Alleghany regions.

The *flowers* of the chestnut, appear in June and July after the leaves are full grown, and when all other forest trees have blossomed; they are small, apetalous and monœcious. The *sterile* flowers are very numerous, in long, erect, white, rigid aments, which emit an unpleasant odor. The *stamens* are from eight to twenty, and have slender filaments. The *fertile* flowers are two or three, enclosed in a scaly involucre. The *fruit* is a four-valved burr, armed on the outside with stiff, sharp bristles, and lined on the inside with a soft, velvety pubescence. It encloses three (or often, by abortion, one or two) edible nuts. The *leaves* are alternate, lanceolate, and coarsely toothed, tapering to a slender point, and are borne on leaf-stalks about half an inch long; the veins are parallel, rigid, and terminate in the mucronate points of the teeth.

An allied species, *Castanea pumila*, commonly called "chincapin," or "chinquapin," is a shrub or small tree found in sterile places from Ohio southward. The flowers, leaves, and fruit of this species bear a close resemblance to those of the *C. vesca*, but are all smaller. The fruit encloses but a single seed which is not flattened as are the seeds of *C. vesca*.

History.—Chestnut leaves should be gathered in the fall, before frost, and carefully dried in the shade. They are of a greenish color, and

exhale a pleasant tea-like odor. At first, slightly astringent to the taste, they become mucilaginous and sweetish when chewed, leaving an after taste very much resembling that of Solanum Dulcamara.

The chief constituent of chestnut leaves is a mucilaginous substance which is slowly extracted from the shreded leaves by means of cold water, and more freely by hot, but which is insoluble in alcohol. Any preparation of the leaves which does not contain this material will fail to relieve the paroxysms of whooping cough, and, for this reason, but little alcohol is admissible in the fluid extract, and thus, undoubtedly, the best preparation is freshly prepared infusion or decoction. Chestnut leaves also contain an astringent principle, and a sweet substance, the other constituents seeming to be simply those found in most plants.—L.

Properties and Uses.—Chestnut leaves appear to have been brought into notice, as a therapeutical agent, by Mr. G. C. Close, in a statement made before the Am. Pharm. Association in 1862. Subsequently, they were employed by the late Dr. J. S. Unzicker, of Cincinnati, who valued them highly in the treatment of whooping cough; since which, most favorable reports have been made by other medical gentlemen, as to their value. These leaves have, thus far, been employed only in the treatment of pertussis, in which malady they have proved remarkably efficacious; but their manner of action has not yet been determined. It is very probable that they may be found useful in other irritable or excitable conditions of the respiratory nerves. Dr. Unzicker employed an infusion of the leaves, an ounce to a pint of boiling water, and administered this in tablespoonful, or small wineglassful, doses, repeated several times a day. The fluid extract, when properly made, will be found reliable; its dose is from half a fluidrachm to a fluidrachm, repeated three, four, or five times daily. Chestnut bark appears to possess astringent and tonic properties, and is used in some sections of country as a popular remedy for fever and ague.—K.

CATALPA BIGNONIOIDES.

Nat. Ord.—Bignoniaceæ. *Tribe.*—Tecomeæ.

The bark of Catalpa bignonioides, *Walt.* (*Syn.*—Catalpa syringæfolia, *Sims.* Bignonia Catalpa, *Linn.* Catalpa cordifolia, *Nutt.*)

Common Names.—Cigar tree, Catalpa tree, Indian Bean tree.

ILLUSTRATIONS.—*Mich'x, F. Sylv.*, Vol. II, Plate 64. *Bot. Mag.*, Plate 1094.

Description.—This tree is a native of the Southern United States, but is cultivated as an ornamental tree and frequently naturalized in the Northern States. It belongs to the natural order Bignoniaceæ and is the only indigenous species of Catalpa, although others are found in Asia and the West Indies. Its *leaves* are large, heart-shaped, opposite or disposed in whorls of three. The *flowers* appear in June and July, and are produced in large, showy, terminal, compound panicles. The *corollas* are about an inch long, white, tinged with purple, and studded with orange spots in the tubes. They are bell-shaped, with a swollen tube, irregularly five-lobed and two-lipped. The *fruit* is a slender, two-celled capsule, about a foot long, a quarter of an inch thick, and hangs suspended until spring. The *seeds* are numerous and winged. The tree is called "cigar tree," or "bean tree," names derived from the

slender fruit. The bark of the trunk is scaly, brown, and from three to six lines in thickness. That of the young limbs, is smooth, dark-grayish, and spotted with lighter colored excrescences. The young bark, and the inner portion of the old, is bitter. Catalpa wood is very durable, rivalling cedar. It is hard, grayish, and of coarse fiber.

History.—In 1870,[1] Eugene A. Rau, made an examination of the inner bark of the tree, and found it to contain tannin, and a nauseating matter soluble in ether. When this substance was boiled with water and oxide of lead, and then filtered, a yellowish solution was obtained, free from alkaloids, and very bitter. The precipitate that separated with the oxide of lead, gave to boiling alcohol a crystallizable, white, neutral substance, which possessed the nauseating bitter taste of the bark, and was soluble in ether and chloroform. In addition to the above, an insipid resin, and glucose, were obtained.—L.

Properties and Uses.—It is stated that poisonous emanations issue from this tree, but we have no knowledge of any serious effects resulting from an exposure thereto. The pods and seeds have been employed in decoction, in chronic bronchial affections, spasmodic asthma, and dyspnœa; six or eight ounces to a pint of water, and given in tablespoonful doses, repeated every hour or two. The leaves, bruised, and applied as a cataplasm, have been used in irritable scrofulous ulcers; they appear to possess anodyne properties. The bark has been employed internally, in powder, or in decoction, in scrofulous maladies, and as an anthelmintic. The juice of the leaves, as well as of the root, has been beneficially employed as a local application in the several forms of strumous ophthalmia, as well as in certain cutaneous affections. From the statements that have been made as to the toxic properties of this tree, and which have not yet been satisfactorily demonstrated, it would be advisable to use some prudence and care in the internal administration of any of its preparations.—K.

CATALYSIS.

CATALYTIC ACTION, OR DECOMPOSITION BY CONTACT.

These terms were used by Berzelius to express the chemical change which is induced in bodies by the presence of another body that apparently remains unaffected by the ensuing reaction. "Catalytic force" was the term applied to the supposed cause of this change. Berzelius first drew attention to this class of actions, and, afterward, the term "contact-action" was used by Mitscherlich in the same sense, the substances which produced the change being called "contact substances." Examples of the action referred to, are seen in the combination induced between oxygen and hydrogen by finely-divided metallic platinum. The decomposition of peroxide of hydrogen into water and oxygen, with almost explosive violence, in the presence of finely-divided platinum, gold, silver, etc. The part taken by manganese dioxide, in effecting the evolution of oxygen from chlorate of potassium at a temperature of 200° C. (392° F.), the manganese dioxide remaining unaltered;[2] while, to procure the oxygen from pure chlorate of potassium

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[1] *Phil. Journ. Pharm.*

[2] Some chemists have supposed that this effect may be explained by a possibility that the manganese dioxide, under the condition referred to, assumes a higher degree of oxidation, and readily changes to a lower oxide, thus parting with a portion of its oxygen.

alone, requires a heat of 350° C. (662° F.), is also classed by many with catalytic action. Other, somewhat similar, examples are found in both the organic and inorganic kingdoms, as in the influence exerted by *excess* of a body or reagent when the exact amount for combination with the other body, or body acted upon, is not followed by chemical change. This is sometimes designated as "*action of mass.*" Explanations for the first class of these more or less obscure phenomena, were suggested by Berzelius as due to some modification of the electric state of the bodies, induced by the apparently inert element. Liebig, Mercer, Playfair, and others, have given attention to the latter class, including the fermentation produced by yeast; but it is certainly difficult to give a satisfactory explanation of all the various phenomena.

CATALYTIC IRON.—Under this name, a preparation was lately (1875) introduced into the European market by Dr. Wagner, without information as to his process of preparation. The only light we have upon the subject is derived from the article by Professor E. Scheffer, read at the meeting of the Louisville College of Pharmacy, February, 1878. (See *Am. Journ. Pharm.*, March, 1878.) Professor Scheffer could not positively state that "Wagner's *catalytic iron* was made by this process, but, as both preparations contain chlorine, and otherwise resemble, the inference may be drawn that such is the case.

Professor Scheffer found that solution of ferric chloride carefully precipitated with ammonia water, until the supernatant liquid above the precipitate is colorless, but still acid in reaction, will, if the precipitate be washed repeatedly with pure water by decantation, at last arrive at a point where it colors the wash-water yellowish, and settles very slowly. If, now, the precipitate be transferred to a filter paper, drained, then washed carefully with small portions of water, it assumes, after a time, a dark, almost black color, shrinks in bulk, and changes to the consistence of jelly. This, in thin layers, is of a deep garnet-red color, is soluble in pure water, forming a deep red solution, and agrees in its properties with those of Wagner's "catalytic iron" solution. Professor Scheffer analyzed several specimens prepared by the foregoing process, and found in all cases the presence of chlorine. He favors the idea that such preparations are solutions of ferric oxide held in solution by means of ferric chloride, such being insoluble in saline solutions. We feel at liberty to state, that Professor Scheffer holds the opinion that it is unnecessary to draw upon an unknown force to explain the foregoing reaction. The washing of the precipitate simply removes the ammonium chloride until at a given point the precipitate dissolves.—L.

Properties and Uses.—These are the same as named for dialysed iron, under *Dialysis*, which see.—K.

CHAMÆLIRIUM LUTEUM.

Nat. Ord.—Liliaceæ. *Tribe*—Melanthieæ. (Melanthaceæ, *Br.*, *Tribe*, Melanthieæ.)

The rhizome of Chamælirium luteum, *Gray*. (*Syn.*—Helonias dioica, *Pursh*. Helonias lutea, *Ait.*)

Common Names.—Unicorn root, False Unicorn root, Blazing Star.

ILLUSTRATION.—Our Plate VI.

(See *American Dispensatory*, 8th ed., p. 418.)

We have adopted *Gray* as authority in the name of this plant, there-

fore the term *Helonias dioica* of former editions will be replaced to conform with the generally accepted classification. The common name is *unicorn root*, derived from the fact that the rhizome resembles a horn. Afterward this term was applied to Aletris farinosa, which is thus the *false unicorn.* Chamælirium is also known under the names, *Drooping Starwort*, *Devil's Bit*, and in former editions of this work, and in other books, as *false unicorn.*

Description.—The Chamælirium (Plate VI) is an erect, slender herb, about two feet high, and without branches.—The *stem* is smooth, round, striate, and terminates in a long, slender spike of small white flowers. The lower *leaves* are obovate-spathulate, smooth, entire, alternate, and exstipulate. They are clustered in at the base of the stem, gradually becoming smaller until the upper are reduced to scales. They are attached at an acute angle to the stem. The radical leaves are obtuse, but those on the upper part of the stem are acute; the veins are parallel, and run lengthwise along the leaf, but are not prominent. The *flowers* are very small, and the fertile and sterile are on different stems; the fertile stems being much more leafy than the sterile. The female flowers consist, each, of six small, linear, white petals, a small, globular ovary, about the size of a grain of hemp seed, with three linear stigmas about the length of the ovary; each one is succeeded by a dry, oblong capsule, opening by three valves at the apex, and containing numerous minute seeds. The sterile flowers are in spikes much longer than those of the fertile, and are from four to six inches in length. They have six linear petals, and the same number of stamens, which have unequal filaments about twice the length of the petals; the anthers are small and globular. The aspect of the flowering stems of male and female plants of Chamælirium is very different, and they would hardly be attributed to the same species by one who has not closely examined them.

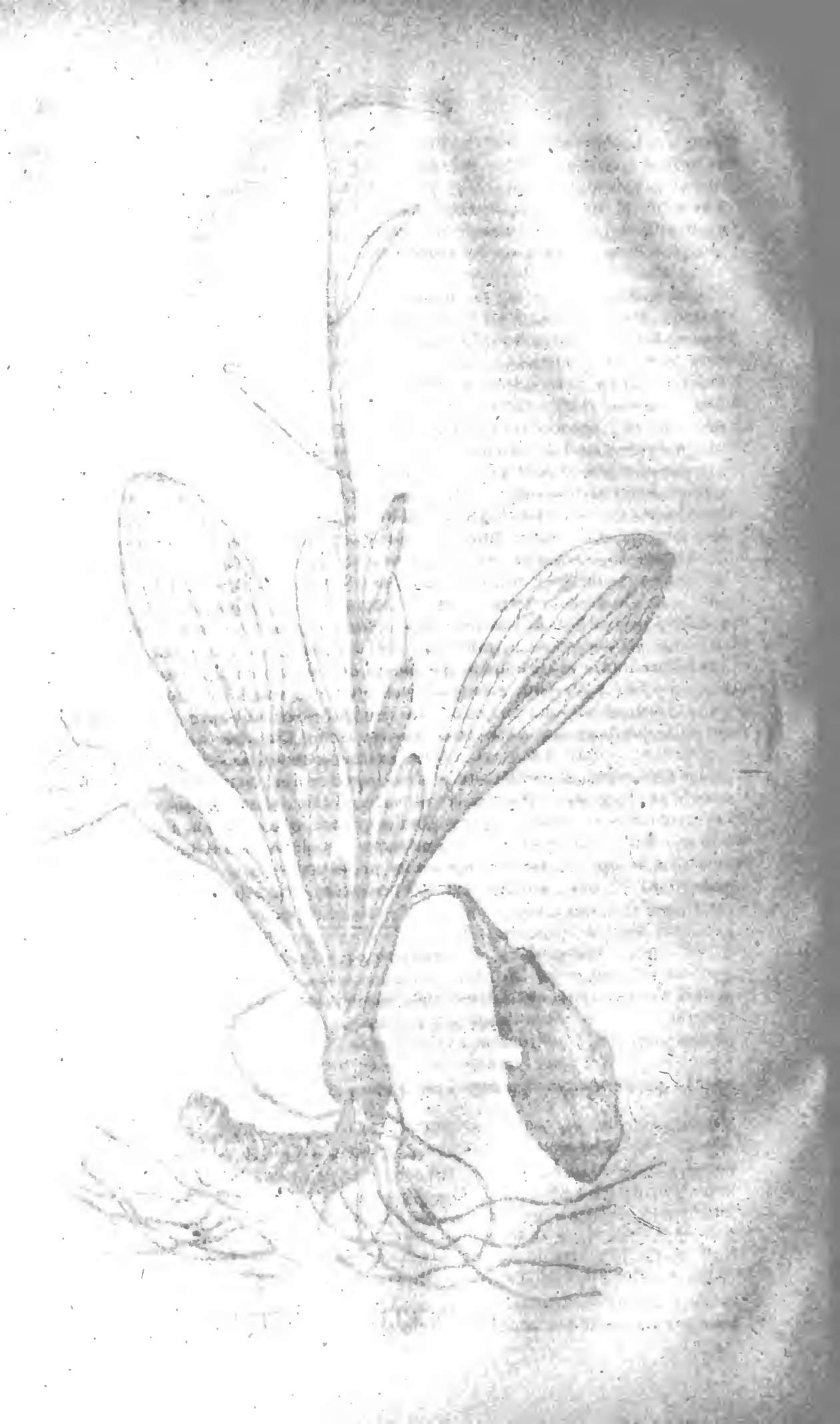
History.—The rhizome of this plant has long been confounded with, and sold for, that of Aletris farinosa, and to such an extent that druggists generally have concluded the two must bear a very close resemblance. This is a mistake, as there is scarcely any likeness between them. The impression as to their similarity of appearance was strengthened by the *Am. Dispensatory*, p. 419, 8th ed., viz: "There has been, and still exists, much difficulty among druggists and herb-gatherers in determining the difference between the roots of Aletris farinosa and Helonias dioica, as they greatly resemble each other," etc. With the view of correcting previous mistakes, and setting right the history of the two plants, we have produced fac-simile drawings, natural size, of both plants (Plates I and VI); and by a simple reference to our engravings of Aletris farinosa and a comparison with that of Chamælirium, it will be obvious:—

1st. That the shape of the leaves and general appearance of the plants are entirely different.

2d. The rhizomæ are utterly unlike, and do not in the least resemble each other.

It is to be regretted that so much confusion has existed with regard to these rhizomæ and the difficulty must be ascribed to the *common names* given them, and not to a resemblance. We have upon the market, the rhizomæ of *Unicorn* and *False Unicorn*, of *Stargrass* and *Starwort*, *Helonias dioica* and *Aletris farinosa.* and the majority of dealers and therapeutists are by no means decided as to the identity of either of them. When ordered by their common names, the roots from one section of country will be the reverse of those from other sections; and

CHAMÆLIRIUM LUTEUM.



when star grass or unicorn root is sold to a druggist, the dealer is uncertain as to whether it will not be returned as "different from that previously purchased." We trust that physicians and druggists will endeavor to expunge in this, and in other cases, the many common terms in use. Strict conformity to botanical names will assist in overcoming this extended and serious evil.

The rhizomæ of Chamælirium are from half an inch to two inches in length, and, when dry, average from one-fourth of an inch to half an inch in diameter. They are mostly curved (horn shape), but some are nearly straight; usually premose (as though bitten off), but sometimes they are pointed. Externally, they are dark-brown, transversely wrinkled, rough and uneven, showing the stem scars upon the upper side. Around the entire rhizomæ are fibrous rootlets, scattered above, and thicker below. The fresh fibers are succulent, with the exception, however, of a hard, ligneous, thread-like center, which remains from one season to another long after the soft external portion has decayed. This gives rise to the appearance of pores or pin-holes upon the surface of the root, through many of which the woody fibers still pass, and extend, as fragments, from half an inch to two inches beyond the surface, and internally, to the central part of the rhizomæ. When the fibers are entirely decayed, the small pin-like holes remain and are often mistaken for worm-holes. Remains of radical leaves are occasionally found attached to the upper end of the rhizomæ, below which will often be observed a bunch of dried fibers, and along the upper side of the rhizomæ may be seen the bases of several annual stems or stem scars. Internally, the rhizomæ are very hard, of a horn-like color and texture, about one-third of the central portion being a little lighter, and partly composed of fibrous matter, from the surface of which the rootlets rise. The dried rhizomæ exhale a peculiar, characteristic, not unpleasant odor, more strongly developed when bruised, or rubbed between the fingers. The taste is very bitter, disagreeable and acrid. The virtues are extracted by alcohol, and, when fresh, by alcohol or boiling water. The rhizome contains a yellowish bitter principle, for which the name *chamælirin* has been proposed.—L.

Properties and Uses.—See *Am. Dispensatory*, ed. 8th, p. 420.—K.

CHLORAL.

Formula, C_2Cl_3OH, or CCl_3COH; molecular weight, 147.01.

CHLORAL HYDRAS.

Hydrate of Chloral.

Formula, $C_2Cl_3H_3O_2$, or $C_2Cl_3OHH_2O$; molecular weight, 164.97.

History.—Chloral was discovered in the year 1832, by Liebig,[1] who obtained it by passing chlorine through absolute alcohol. In 1845, Stadler procured it by the action of nascent chlorine upon various organic substances, and also by the distillation of starch, binoxide of manganese, and hydrochloric acid. It excited but little interest until the year 1869,[2] at which period hydrate of chloral was introduced to the medical profession by Dr. Oscar Liebreich, teacher of therapeutics in the University of Berlin. Shortly afterward, in the same year,

[1] *Gmelin's Chemistry*, vol. ix. [2] *Pharm. Journ.*, 1869, p. 150.

both Mr. Hanbury and Dr. Richardson brought specimens before the English medical and therapeutical associations, and subsequently its introduction to other countries soon followed.

The word *Chloral* is derived from the first syllables of chlorine and alcohol. Chloral is a colorless fluid, oily in appearance, and of the sp. gr. 1.518, at 32° F. (0° C.). At ordinary temperatures it evolves a pungent vapor that is very irritating to the eyes. It has a disagreeable taste, is soluble in less than its weight of water, and in four times its weight of chloroform. Chloral dissolves phosphorus, sulphur, bromine, and iodine, the latter solution giving a very rich purple color. Heat facilitates their solution. Anhydrous metallic oxides have no action upon it. It unites with water to form a hydrate. The formula for chloral is C_2Cl_3OH, and its modern name is Trichloraldehyde. It is made by passing chlorine gas into anhydrous alcohol.

The reaction which produces chloral is generally considered as very complex.[1] In practice, it is customary to first reduce the temperature of the alcohol through which the chlorine passes, then, as the solution thickens, to apply heat until hydrochloric acid gas ceases to be evolved and chlorine appears, when the flow of chlorine is discontinued.[2] The crude chloral alcoholate, together with other incidental products of the reaction, is now agitated with sulphuric acid, and then distilled; it is now purified, by again distilling it, from a small portion of quicklime, being careful not to have an excess of lime, or the chloral will be destroyed. Chloral is decomposed by solutions of caustic alkalies, yielding a formate of the base, and chloroform. It is not employed in medicine, and is of interest only from the fact that it unites with one equivalent of water to form chloral hydrate.

CHLORAL HYDRATE, $C_2Cl_3H_3O_2$, or $C_2Cl_3OHH_2O$, is prepared by mixing chloral with the proper amount of water, and then pouring the solution, in thin layers, into a porcelain or glass dish; this is covered and placed in a cool situation. Heat is liberated, and the liquid solidifies, forming a mass of pure dazzling whiteness, composed of minute, transparent, or semi-transparent crystals, or crystalline plates of chloral hydrate. These have a sweet, ethereal odor, a greasy feeling when rubbed between the fingers, and a pungent taste. According to Versmann, one hundred parts of water dissolve three hundred and sixty parts of chloral hydrate.

Chloral hydrate fuses, at about 58° C. (136° F.), boils at 95° C. (203° F.), with partial decomposition into chloral and water, and readily distils at 120° C. (248° F.). It is soluble in very small quantities (less than its weight) of water, and equally soluble in ether or alcohol; soluble in four parts of cold chloroform; but slightly soluble in carbon disulphide, and in spirits of turpentine. Its alcoholic solution is neutral, and, when the chloral is pure and recent, the aqueous solution is also, but with the chloral of commerce the latter solution usually exhibits a slight acid reaction. Chloral hydrate dissolves in glycerin, and this solution has the property of dissolving many alkaloids that are

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[1]See *Comptes Rendus*, lxxiv, for explanation by Wurtz and Vogt.

[2]When the therapeutical use of chloral hydrate was first agitated in this country, the writer was obliged to prepare the article in a limited way, until a supply could be obtained from abroad. Few persons can realize, without actual experiment, the care that is necessary, and the large amount of chlorine required for the production of even a limited quantity of this agent. It has been calculated that one pint of alcohol will require at least 316 gallons, or 73,233 cubic inches of chlorine, and there will be formed about 396 gallons or 91,542 cubic inches of hydrochloric acid gas.—L.

nearly or quite insoluble in that menstruum (glycerin). This property of dissolving alkaloids insoluble in water, is also possessed by the aqueous solution of chloral hydrate, and both this and the solution of chloral hydrate in glycerin, was recommended for the purpose by Mr. Faithorne. By placing together molecular weights of camphor, and chloral hydrate, a clear liquid results, which is decomposed by water into the original substances. This liquid was named *camphorated choral*, but is rarely used.

With aqueous solutions of the caustic alkalies, chloral hydrate is entirely resolved into alkaline formates and chloroform. Thus, with hydrate of sodium, the reaction will be as follows: $C_2Cl_3H_3O_2 + NaOH = CHCl_3 + NaCHO_2 + H_2O$. It was this property, which chloral hydrate possesses, of producing chloroform when in contact with an alkali, that led Liebreich, in 1869, to reason that it might be used as a remedial agent. In 1873, it was found that chloral hydrate would prevent decomposition of albuminous substances, such as milk, meat, and animal matters generally,[1] and it is at present used in solution for injecting anatomical subjects. Chloral hydrate solution rendered slightly alkaline with carbonate of sodium, entirely prevents the coagulation of blood (*Ore*).

Tests.—According to Meyer and Haffter, 165.5 grams of chloral hydrate neutralize 1,000 c.c. of normal sodium solution. Theoretically, chloral hydrate should yield 72.2 per cent. of chloroform, when agitated with slight excess of strong solution of caustic alkali; but, practically, the yield is generally between 70 and 72 per cent., often below 70 per cent. with commercial chloral hydrate. Chloral hydrate should never present a pink appearance, and should dissolve in concentrated sulphuric, hydrochloric, or nitric acids, with formation of colorless solutions, and, with the *latter* acid, should not evolve red fumes. When pressed between two pieces of filtering or blotting paper, chloral hydrate should produce no stain.

When aqueous solution of chloral hydrate is acidulated with dilute sulphuric acid, and the solution faintly tinged with a few drops of solution of permanganate of potassium, it should not decolorize in several hours. If the solution becomes quickly colorless, the chloral hydrate has partly decomposed. Physicians often, but erroneously, prescribe chloral hydrate under the name "chloral.'

Antidote.—Dr. Liebreich announces strychnia to be an antidote to the action of hydrate of chloral, basing his conclusions upon experiments performed upon rabbits (*Comptes Rendus*, Feb., 1870). It must be remembered that this antidote is in itself a powerful poison, and care must be exercised in its administration.

CHLORAL ALCOHOLATE.—When chloral is mixed with one equivalent of alcohol, white crystals of chloral alcoholate are formed, resembling, in appearance, hydrate of chloral. They differ, however, in therapeutical action, and in being freely soluble in cold chloroform, carbon disulphide, and turpentine, while less soluble in cold water than the hydrate. When warmed with sulphuric acid, a reddish-brown, or brown solution, is formed, and with nitric acid, red vapors are evolved (*Hoffman*). Chloral alcoholate yields 59 8 per cent. of chloroform. It is not used in medicine, unless as an adulterant of chloral hydrate, and is of interest simply from the relation it bears to this substance.—L.

Properties and Uses.—In addition to what has been stated in *American*

[1] *Comptes Rendus*, Feb., 1874, and *Pharm. Journ. and Trans.*, 1876.

Dispensatory, 8th ed., p. 883–5, we will observe that, unless the chloral hydrate is pure, it may not only fail in producing some of its beneficial effects, but it may likewise occasion serious symptoms; and it is by no means improbable that the unexpected deaths that have sometimes followed its internal administration in medium doses were due to the impurity of the chloral employed. In all cases of sleeplessness, and more especially when this condition is the result of brain exhaustion, from previous mental or moral excitement, chloral is indicated, but it should not be administered to persons greatly enfeebled, nor to those who are subjects of any dyspnœic or cardiac affection. During parturition, chloral hydrate, in doses of from fifteen to thirty grains, repeated every half hour or hour, and continued no longer than is necessary to effect the desired result, is stated to have been useful in regulating uterine contractions, and lessening their severity, in favoring dilatation of the os, and in soothing undue nervous and mental excitability. By those who have employed it in eclampsia, it is considered one of the best agents for overcoming the convulsions, although instances of failure have occasionally occurred; in this malady, it is administered in doses of ten or fifteen grains, repeated as required, every ten, fifteen, or twenty minutes; and in severe cases, from thirty to sixty grains in solution may be employed as a rectal enema. In epilepsy, chorea, pertussis, and paralysis agitans, although not effecting recovery, it greatly lessens the severity of the paroxysms, as well as of muscular movements. One part of chloral hydrate dissolved in six parts of distilled water, and administered in fluidrachm doses every half hour, has frequently proved advantageous in hemicrania, as well as in retention of urine; in these cases, after sensations of relief have been experienced, the intervals between the doses should be extended to every two hours, for the last three or four periods of administration.

As a local application, chloral hydrate has proved serviceable in several affections. Equal parts of chloral and distilled spirit of horseradish root, applied upon the affected parts by means of a soft sponge probang, every day, or every other day, has proved efficacious in the ulitis of pregnant women; before applying it, the mouth should be cleansed, and any excess of tartar on the teeth be removed. It produces a slight degree of pain, and leaves a superficial, whitish eschar, which disappears after some hours. Finely-powdered chloral hydrate sprinkled upon the surface of a Burgundy-pitch plaster, and this applied over painful parts, has been found efficacious in lumbago, sciatica, pleurodynia, and intercostal neuralgia. The plaster must be allowed to remain upon the part for one or two days, or until the skin beneath becomes covered with small vesicles filled with a limpid serosity; the plaster is then removed, each vesicle opened with a needle, and the whole covered with simple cerate spread upon a soft cloth. They become speedily healed. In scald-head, baldness, dandruff (*pityriasis*), and especially in obstinate, indolent ulcers, the local application, daily, of a solution of chloral hydrate, ten or twenty grains in distilled water one fluidounce, will be found highly efficacious; some smarting may follow each application. A weaker solution will be advantageous as a palliative and antiseptic in ulcerated cancer of the breast, cancer of the uterus, in suppurating cavities, diphtheritic and gangrenous surfaces, also to remove the offensive odor in ozœna, as well as that which emanates from the axillæ and feet of certain persons. It may be applied on lint, or be used as a wash, by injection or by spray. A solution of chloral hydrate, thirty grains to the ounce of water, will often prove

serviceable as a local application to painful bunions and chilblains. One part of chloral to sixteen parts of carron oil, forms a mixture that has acted promptly and efficaciously in burns and scalds.

Chloral hydrate is not used in subcutaneous injection, as its action is too irritating and apt to be followed by troublesome abscesses, and should it be injected into the veins, its influence upon the heart and lungs is of a dangerous nature. Internally, for an adult, its dose varies from ten to thirty grains, to be repeated every one, two, or three hours, as indicated; children require much less, say, as many grains for a dose as there are years of the child's age. It may be given in some aromatized syrup, to conceal its taste. When used in enema, the saturated solution should be mixed with some mucilaginous, albuminous, or oleaginous fluid. The poisonous or unpleasant symptoms following the use of chloral are best treated by frictions, artificial heat to the body and limbs, coffee, artificial respiration, faradization, and, in some cases, the cold douche upon the head and dorsal vertebræ.—K.

CLEMATIS VITALBA.

Wild Clematis, Traveler's Joy.

(See *American Dispensatory*, 8th ed., p. 265.)

Gaube has extracted a principle from this plant, to which he has given the name *clematine;* it is alkaline, and forms a neutral compound with sulphuric acid, which crystallizes in hexagonal needles. Besides this principle, he has also detected an essential oil, to which it owes its properties, resembling those of Daphne gnidium, tannin, mucilaginous substances, and a small amount of earthy salts.

The seeds of Clematis, given in infusion, have been found serviceable in albuminaria, even when general anasarca, amblyopia, incipient hypertrophy of the left ventricle, without valvular lesion, and which condition is, as M. Traube has shown, always a result of abnormal conditions of the kidneys, and other symptoms peculiar to this disease were present. The effects of the remedy were quite prompt, a profuse diuresis, followed by a gradual diminution of albumen in the urine and a rapid disappearance of the anasarca, and other symptoms. This infusion has likewise proved efficacious in other serous affections due to other maladies of the abdominal viscera (*Prof. Sauveur*).—K.

CONDURANGO or CUNDURANGO.

The Bark.

History.—This plant was introduced in 1871, in rather an official manner, having been received by the State Department at Washington, from the Minister of Eucador. The drug was accompanied by certificates from two physicians of the province of Loja, attributing to the bark great power to cure cancer, syphilis, etc. The statements were supported by a letter from our Minister at Eucador. An analysis of the plant threw but little light upon the subject, as substances common to most plants were only found, thus: a little resin, coloring matters, gum, glucose, mineral salts, etc. Shortly after it came into notice, a note from Mr. Dan. C. Robbins, of New York, to the editor of the *Am. Journ. of Pharm.*, stated that Mr. Wiehl, U. S. Consul at Guayaquil, had

favored him with specimens of the flowers, leaves, and fruit of the true Condurango vine. It was stated that the name Condurango meant "Eagle vine," and that there were some six varieties, three of which were used in medicine, and were known in Spanish by names signifying dog-killer, big fruit, and little fruit. The "dog-killer," which is true Condurango, is a tropical climbing vine, seeking the highest trees of the Cinchona region of South America.

Doubtless, the market was supplied with barks of several species of climbing plants, and this supply will not need replenishing for some time to come, unless the demand becomes more active than at present, for it is seldom prescribed.

The bark only is recommended for use. It is in thin pieces, of a whitish or yellowish color, reminding one of the bark of ptelea root. The taste is slightly bitter and aromatic.—L.

Properties and Uses.—This agent, at one time so highly lauded as a positive remedy for cancer and syphilis, is rarely employed at the present time, and should it even possess any valuable therapeutic virtues, they are not likely to be ascertained for some time to come, as the exaggerated statements and misrepresentations attending its introduction have led the profession to regard it with suspicion and incredulity.—K.

CORIARIA MYRTIFOLIA, *Linn.*

Nat. Ord.—Coriariaceæ.

The leaves of Coriaria Myrtifolia, *Linn.* (*Syn.*—Rhus Coriaria, *Linn*).

Common Name.—Myrtle-leaved Coriaria.

Description.—This is a low unarmed shrub of the Mediterranean regions. The *leaves* are opposite, entire, lanceolate, acute, short petiolate, and prominently three-veined. The *flowers* are small, inconspicuous, in erect, terminal racemes. The *sepals* are five, and imbricated in the bud. *Petals* five, fleshy, gland-like and shorter than the calyx. The *carpels* are five, distinct, and each is furnished with a long, thick, exserted stigma, which protrudes from the bud, and forms the most conspicuous part of the flower. The *fruit* is a small, black berry, not larger than a common pea.

History.—The leaves contain a poisonous bitter principle, which has been investigated by Ribau, and which is named *Coriamyrtin.* It is obtained by precipitating the aqueous extract of the leaves with subacetate of lead; filtering, treating the filtrate with sulphide of hydrogen; filtering again, and evaporating the filtrate to a syrupy consistence, from which substance ether dissolves the coriamyrtin; it may subsequently be purified by recrystallization from alcohol. It is a neutral, white body, very bitter, forming in from four to six-sided prisms, which are soluble in seventy parts of cold water, and slightly more soluble in boiling; are very soluble in boiling alcohol, and in fifty parts of cold; also soluble in ether, chloroform, and benzol, but only slightly so in carbon disulphide. Dilute acids split it into a substance resembling sugar, and a resin. In addition to this principle, the leaves contain tannin, and are used for tanning leather, and dyeing black. They have likewise been employed to adulterate senna,—a dangerous fraud, as, according to Dr. Masters, they have caused convulsions and subsequent coma. The best distinctive character is the *three* prominent veins of

the leaves, while senna leaves have but one. The fruit of this shrub is poisonous, and proved fatal to some French soldiers at Catalonia, who ate of it.—L.

Properties and Uses.—Both the leaves and berries are poisonous. M. Ribau gave about three grains of the bitter principle to a large dog, and although it was immediately ejected, horrible convulsions occurred in about twenty minutes, followed by death in seventy-five minutes; one grain of this coriamyrtin killed rabbits, and the subcutaneous injection of three-tenths of a grain killed a rabbit in twenty-five minutes. The symptoms following its administration to these animals were rapid succussions of the head extending to all the limbs, clonic and tetanic convulsions coming on in paroxysms; contraction of the pupils, trismus, and foaming at the mouth; the animals died from asphyxia and nervous exhaustion. Autopsy found the vessels gorged with brown blood, coagulated in the cardiac cavities, the pulmonary artery, and the inferior vena cava; brown patches on the lungs; injection of the meninges; rapid cadaveric rigidity. No irritating action appeared upon the digestive tube. In cases where children have accidentally eaten the fruit, the symptoms have been a condition like that occasioned by alcohol (drunkenness), aphasia, frothing, purplish countenance, nausea, vomiting, convulsions, and death in from fifteen to twenty hours. The plant has not yet been employed in medicine. The New Zealanders have a *toot-poison*, which is very destructive to human and animal life, and which, it is stated, is procured from *Coriara sarmentosa*, (*Forst*).—K.

COTO BARK.

The bark of an undetermined South American tree.

Description.—Coto bark is exported from the interior of Bolivia, but the tree from which it is derived is unknown.[1] In 1875, Dr. Wittstein received a few pounds for chemical examination, with the statement that it was produced by a species of Cinchona; this was disproved, however, by Harz, after a microscopic examination.

Coto bark reaches us in pieces of from four to twelve inches in length, two to four inches in width, and from half an inch to three-fourths of an inch in thickness; the outer or corky portion is about the sixteenth of an inch in thickness, dark-brown internally, rusty upon the inner surface, and externally grayish-brown, or blotched with spots of white. The surface is somewhat rough. Beneath the thin cork it is of a dark-cinnamon color; fibrous upon its inner surface and intermixed with some granular matter; but, toward the outer part, the granular matter increases in proportion until the reverse is true. Its fracture presents very numerous points of a golden yellow. The odor of the bark is aromatic, especially when freshly broken, reminding one of mace, or of a mixture of mace and cinnamon. The taste is spicy, to the writer intermediate between that of mace and allspice, finally becoming acrid and biting. The dust is irritating when inhaled.

Constituents.—Dr. Wittstein found this bark to contain: a very pale-yellow aromatic volatile oil, of less density than water, and biting to the taste; a volatile alkaloid resembling propylamin, and two resins, besides a tannin, formic, butyric, and acetic acids, etc. The first resin

[1]The bark of Palicurea densiflora (*Mart*), is known in Brazil under the name Coto-coto.

was soft, like pitch, yellowish-brown, very soluble in ether, chloroform, and alcohol; slightly soluble in benzine, and hardly soluble in disulphide of carbon. Its solutions were acid. The fixed alkalies and ammonia dissolved it, and acids separated the resin from its alkaline solutions. It was of a biting taste, of an aromatic odor, and constituted about fourteen per cent. of the bark. The second was hard, dark-brown, brittle, inodorous, tasteless, but imparted bitterness and acidity to its tincture, was soluble in alkalies, but insoluble in ether, benzine, chloroform, and disulphide of carbon, and was obtained to the extent of about ten per cent.

Later, Jobst obtained a crystallizable body, *cotoin*, possessing the biting taste peculiar to the bark, and which he supposed represented its medicinal virtues. Afterward, he found another crystalline body in another sample of bark (since named Para-coto Bark), and named it *paracotoin*. Still further examinations by Jobst and Hesse, gave conflicting results, and later researches by the same parties demonstrated that the discrepancies were due to the fact that two barks are upon the market under the name *Coto*, and only to the first, that examined by Wittstein, should the term (Coto) be applied; *Paracoto* bark being accepted as the name of the second.

COTO BARK, according to the recent investigations of Jobst and Hesse,[1] contains *Cotoin*, which was obtained by the following process: Coarsely-powdered Coto bark being placed in a percolator, was exhausted by cold ether; the percolate was placed in a vessel upon a water-bath, and reduced to one-tenth of its volume, and then, while yet warm, was transferred to a porcelain capsule and six parts of petroleum-ether added to it, with agitation. A mild heat was now applied and continued until all ether had been removed. During this evaporation, resin was largely deposited, leaving a clear liquid above. This liquid, while warm, was poured off, and then set aside to crystallize. With the formation of the crystals, a small amount of resin was precipitated; in order to separate these, the liquid was stirred, and at the right moment, the resin having fallen to the bottom, the liquid containing the crystals was poured upon a filter. The crystals collected upon the filter were purified by dissolving them in boiling water, and re-crystallizing them—repeating this process several times. Cotoin forms in square prisms of a light yellowish-white color, having an intensely biting taste. They are soluble in alcohol, ether, chloroform, carbon disulphide, and boiling water, and nearly insoluble in cold water; are colored brown-red when in alcoholic solution, by ferric chloride; have a burning, acrid taste; melt at 266° F. (130° C.), and yield benzoic acid and by-products when heated with either strong hydrochloric acid or potassium hydrate. The composition of Cotoin is $C_{22}H_{18}O_6$. With bromine, it forms *tribromcotoin*, $C_{22}H_{15}Br_3O_6$, and with acetic anhydrid *Triacetyl-cotoin*, $C_{22}H_{15}O_3(C_2H_3O_2)_3$. The authors, in addition to *cotoin* discovered in the mother liquor, after crystallization of cotoin, a body which crystallized in nearly white scales, having the composition $C_{44}H_{34}O_{11}$, and which they named *dicotoin*.

PARA-COTO BARK resembles Coto bark in its general appearance, but has a much weaker odor, and only a faintly pungent, acrid taste. It reaches market under the name *Coto*, and is packed in exactly the same manner, thus, it is said, rendering its substitution in commerce frequent. The principal constituents are, PARACOTOIN, which crystallizes from an

[1] *Liebeg's Annalen der Chemie*, Vol. cix, pp. 17-96.

ethereal tincture of paracoto bark in yellowish scales, and has the composition $C_{19}H_{12}O_6$. Solution of hydrate of potassium, or of sodium, converts it into *paracotoic acid*, $C_{19}H_{17}O_7$. LEUCOTIN, a substance crystallizing in white prisms, is present in larger proportion, and is obtained by agitating with glacial acetic acid, the crystalline mass resulting from evaporation of the tincture of paracoto bark. The leucotin dissolves in the acetic acid, and may be purified by recrystallization from hot dilute alcohol. Its composition is, $C_{34}H_{32}O_{10}$. OXYLEUCOTOIN is obtained from the alcoholic mother liquor, after separation of paracotoin, and has the composition, $C_{34}H_{32}O_{12}$. An agreeable volatile oil was also obtained, by distillation of the bark with superheated steam, colorless, specific gravity 0.9275, and separating into five distinct compounds by means of fractional distillation, with boiling points ranging from 160° C. (320° F.) to 242° C. (467°.6 F.). In addition to the foregoing, several other products were identified, and we refer the reader, if interested, to the original article, or the abstracts published in the *Am. Journ. Pharm.* and in *New Remedies*, January, 1880. In this country, Coto bark, in substance, in tincture, or in fluid extract, is always used in medicine.—L.

Properties and Uses.—Coto bark, in the form of powder, tincture, or extract, has been successfully employed in diarrhea; M. von Gietl considers it a specific in the several forms of diarrhea. Burkart and Rieker have found it to possess extraordinary virtues in intestinal catarrh, diarrhea and dysentery. It has likewise been employed beneficially in colic, dental nervous pains, in gout, and in rheumatism. The tincture, made by percolating one part of the coarsely-powdered bark with nine parts of alcohol, may be given in doses of ten drops, repeated every two hours; the powder, in doses of half a grain, repeated four, five, or six times a day. The effects of the tincture and the powder are, however, very disagreeable, owing to the essential oil and the resinous principles present in them, producing a persistent, burning taste in the mouth, with increased flow of saliva, a burning sensation in the stomach, with eructations and vomiting, on which account the active principle, cotoin, has been substituted, as it does not occasion these unpleasant symptoms, and is fully as efficacious. Cotoin is especially useful in cases in which opium or its preparations are contra-indicated; its dose is very small, thus: in four fluidounces of distilled water, dissolve seven-tenths of a grain, or a grain and one-fifth, of cotoin, to this add ten drops of alcohol, and one ounce of syrup. The dose is a tablespoonful, every hour or two.—K.

CURARE.

The poisonous preparation, Curare.

History.—Curare is a frightfully poisonous extract, prepared by the savages of South America, for the purpose of poisoning the points of their arrows. It is known under various names, bearing a general resemblance, such as, woorari, woorara, curari, cururu, ourari, wowali, etc.

It is said to have been first brought to Europe by Sir Walter Raleigh. It was mentioned by the Fathers d'Acunja and d'Artieda, who visited the Amazon River in 1693.[1] In 1745 De la Condamine brought the

[1] *New Remedies*, 1877.

poison to the notice of the French Academy. It was carefully described by Waterton (1812),[1] together with a process of preparation, as followed by the Macoushi Indians.

Regarding its origin authorities disagree, but it is known that different tribes vary the plants that enter into its composition, and thus we have little reason to doubt the conflicting statements of travelers. Waterton states that a vine called by the Macoushi Indians "Wourali," is the poisonous agent; although, according to him, they add the fangs of vipers, and plants that simply give bulk to the extract. Bancroft (1769) obtained from the Accawan Indians, a receipt for making it from native plants, under local names, and from one of these plants (woorara) the extract seemed to derive its name. According to the latest authority, Dr. Jobert, the Tecuna Indians, at Calderao (Brazil), prepare curare from Strychnos Castelnœ (*Weddell*), Cocculus toxiferus (*Weddell*), Didelphos cancrivora, a plant belonging to the Arum family known as "Taja," a plant of local name "Toucan's tongue," and three Piperaceæ of the genus Artanthe. These are extracted with water, and evaporated to an extract. According to Jobert, the Strychnos Castelnœ and the Taja are the most poisonous of the constituents.[2] Doubtless the species of pepper are simply used as a preservative.

In appearance, curare seems to differ according to its origin and its age. Sometimes, it is described as a syrup, into which the points of the arrows are dipped; again, it is met with of a hard resinous appearance. It is, in reality, simply a vegetable extract, and may be expected to vary as much as other extracts; and we know that time and mode of preparation will change the general appearance of all solid extracts. In quality also, it is uncertain; according to Blodgett (1878), the most valuable article presented a glistening fracture, and was of a dark-brown color. Doubtless those specimens which contain the largest proportion of the extract from the species of Strychnos or of Cocculus toxiferus, are most poisonous. Although, in 1828, Roulin and Boussingault announced the poisonous principle to be curarin, yet, for some years afterward, it was believed by many that curare depended upon strychnia and brucia for its poisonous property, an opinion now considered erroneous by the best authorities; and although Oberdörffer announced that woorara, from three sources, yielded both strychnia and brucia, and Wittstein announced both alkaloids to be present in woorara from Brazil, and in the wood of Strychnos toxifera (*Schomb*), it is generally accepted, at the present day, that curare contains curarin, a very poisonous substance, resembling strychnia in some respects, but differing quite markedly in others.

Curare is of a bitter taste, soluble in cold water to the extent of about seventy-five per cent., which fluid also extracts the poisonous substance known as curarin.

Curarin is an alkaloid, and was obtained by Roulin and Boussingault as an amorphous yellowish substance; it has since been purified and crystallized. It is colorless or white, of a bitter taste, deliquescent to a certain extent in moist air, soluble in water, and in alcohol, less soluble in chloroform, and insoluble in pure ether, benzol, oil of turpentine, and disulphide of carbon. It has an alkaline reaction, and unites with acids to form crystallizable salts. According to Sachs, it exists naturally as a sulphate. It may be separated from strychnia, if mixed

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[1] *Waterton's Wanderings in South America.*

[2] *New Remedies*, April, 1878, from *Bulletin de Therapeutique.*

with that alkaloid, by benzine, in which substance, according to Fluckiger, curarin is insoluble.

Antidotes.—Vella,[1] in 1861, decided that strychnia and the poisonous principle of curare, antidoted each other, basing his assertions upon actual experiments, in which large doses of both substances were administered to dogs without fatal effect, while afterward the same amount of strychnia alone, resulted in death,[2] but caution must certainly be employed in the use of so powerful a poison, even in the way of an antidote. In the *N. Y. Med. Gazette*, July, 1855, Drs. Brainard and Green announce that a solution of iodine one part, iodide of potassium two parts, and water forty-eight parts, acts as an antidote to the poison when the antidote is injected under the skin, and neutralizes it when mixed with its solution. Extreme care must be employed both in handling and administering so deadly a substance. It should by no means be permitted to come into contact with a cut, abrasion, or scratch; indeed, it were safer never to handle it with the naked fingers; neither should we attempt to pulverize the dry article, as its inhalation is dangerous.—L.

Properties and Uses.—Curare, or woorara, produces its poisonous effects only when it has penetrated into the circulation, either by means of a wound, by rectal injection, or by inhalation (*Pelouze* and *Bernard*). It is seldom toxic when introduced into the stomach, although it would be prudent to use some care in its internal administration, as fatal results are stated to have followed its ingestion in maximum doses, or when taken upon an empty stomach. The symptoms following its introduction into the circulation are muscular paralysis (which, more or less rapidly, becomes general), stupor, suspended respiration, sometimes convulsions, and death, the heart continuing to act for some time after all other indications of life have disappeared. It is stated that animals have recovered from its effect, even at this stage, artificial respiration having been resorted to before the heart had wholly ceased its action. The difference in the character, and in the rapidity of the symptoms observed in poisoning by this agent, is supposed to be due to a difference in its composition, and to its more or less rapid expulsion through the urinary organs. The causes of the phenomena produced by it are not satisfactorily determined; they have been variously attributed to paralysis of the respiratory nerve centers, and of the motor nerves; to a primary and direct action upon the heart; to a primary influence upon the nerve terminations, etc. It has no effect upon the pulse or physical temperature, and no perceptible change has been observed in the character of the blood nor in that of the solid textures; hence, it can not be a blood poison.

The therapeutical employment of curare has been suggested in certain severe and obstinate spasmodic affections, as in epilepsy, chorea, hydrophobia, and, more particularly, in tetanus. It is used by subcutaneous injections of its filtered aqueous solution, thus: add curare, one grain, to distilled water twenty-four minims; dissolve, let the solution stand forty-eight hours, and filter; of this, from two minims (one-

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[1] *Pharm Journ.*, 2d series, Vol. ii.

[2] Mr. H. S. Wellcome exhibited, at the meeting of the Am. Pharm. Assoc., held in Indianapolis, Ind., 1879, arrows brought by himself from South America and poisoned by the Indians with curare. These arrows have been dipped into a *paste* (soft extract), about one-half an inch of each point being covered with the poisonous extract. Mr. Wellcome informed the writer that the natives could antidote the poison if treatment was instituted at once, but that they refused to name the antidote.—L.

twelfth grain) to six minims (one-fourth grain) may be used at one injection, carefully repeating the injections until relaxation of the muscles has been effected. Curarin, dissolved in water, with a few drops of sulphuric acid added, to facilitate its solution, is to be used in still smaller doses,—from the two hundred and fortieth part of a grain to the one hundred and twentieth. It is doubtful whether this agent will ever come into general use as a medicinal remedy; at least, not so long as other medicines are known upon which greater confidence can be placed. The diversity of action, attributable, in some instances, to its difference of composition, in others to its inertness, or to its highly active qualities, render it an uncertain, as well as an unsafe, remedy.—K.

CURCAS PURGANS.

Nat. Ord.—Euphorbiaceæ. *Tribe.*—Hippomaneæ, *Muller.*

The seeds of Curcas purgans, *Adanson.* (*Syn.*—Jatropha Curcas, *Linn.*).

Common Name.—Purging nut; Physic nut.

Description.—This is a large, thick-stemmed, lactiferous shrub, a native of the Cape de Verd Islands (*Pickering*), but cultivated as a hedge plant, as well as for its oil, and has also been naturalized in the West Indies, South America, and in most parts of the tropics. The plant was formerly referred to Jatropha, from which it differs in having a monopetalous corolla. The *leaves* are heart-shaped, smooth, five-lobed, and on leaf-stalks two or three inches long. The *flowers* are small, green, monœcious and in axillary, stalked cymes. The *corolla* and *calyx* are five-parted, and the male flowers have ten stamens. The *ovary* is three-lobed, three-celled, and has a three-parted style. The *fruit* is a fleshy black berry, and contains three seeds, about an inch in length. The kernel is oily, inodorous, sweetish to the taste, followed by acridity.

History.—The seeds are called purging nuts, nuces catharticæ Americanæ, Semina Ricini majoris, Semen Curcadis, Ficus infernalis, Nuces Barbadenses, physic nut, etc.,[1] and affords an oil, upon pressure, which is a drastic cathartic, and which has been used to adulterate croton oil. This oil was examined by M. J. Bouis (1854),[2] who obtained it from the nuts, by pressure, to the amount of thirty-seven per cent. It is white, has a density of 0.910 at 62° F. (16½° C.), is almost insoluble in alcohol, easily saponified by soda, forming a white, hard soap. It is decomposed by heat, yielding, among other products, sebacic acid. When it is saponified by potash and the resulting soap is decomposed by muriatic acid, a mixture of fatty acids is produced, from which, by pressure, from eighteen to twenty per cent. of a white, solid acid may be separated. This is soluble in hot alcohol, from which, on cooling, it is deposited in brilliant spangles. It fuses at 131° F. (55° C.), and solidifies at 128 F. (53° C.). From its close resemblance to cetic acid (as it has the same chemical composition, $C_{30}H_{29}O_3 + HO$), Bouis named it isocetic acid.[3] Besides the above, Bouis found another acid, which is liquid at 13° F. (—10½° C.).—L.

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[1] *New Remedies*, 1878, from *Zeitschrift des Oestere, Apoth. Vereins.*

[2] *Comptes Rendus*, xxxix.

[3] Isocetic acid also forms the glycerid of the solid part of castor oil.—L.

Properties and Uses.—The seeds of Purging or Barbadoes Nut, occasion emetic and drastic cathartic effects, accompanied with a burning sensation in the fauces and stomach, and other unpleasant, and even serious, symptoms. However, if the seeds be entirely deprived of their embryo, the emesis and other disagreeable sensations do not occur. The juice of the leaves acts as a rubefacient, and has been successfully employed, in the countries where the shrub grows, as a local application in rheumatic pains, in certain eruptive affections, and in piles. The oil, in the dose of ten or twelve minims, is a cathartic, somewhat resembling croton oil in its action, though less severe. It may be used in all cases where the employment of croton oil is indicated.—K.

CYCLAMEN.

Nat. Ord.—Primulaceæ. *Tribe.*—Primuleæ. The tuber of Cyclamen hederifolium, *Willd.* (*Syn.*—Cyclamen Europæum, *Mill.*)

Common Name.—Sow Bread.

ILLUSTRATION.—*Bot. Mag.*, Plate 1001.

Description.—Cyclamen hederifolium is a native of Italy and Sicily, and is occasionally found naturalized in the wet, clayey soil of England. The *leaves* are all radical, on slender leaf-stalks; they are heart-shaped, finely-toothed on the margin, and variegated with light and dark-green color. The *flowers* are solitary and nodding, on long slender stalks; they closely resemble the flowers of the American cowslip, *Dodecatheon Meadia*. The *corolla* is monopetalous, with a very short tube, and a large, reflexed, five-parted limb, which gives the flower an odd appearance. The *fruit* is a many-seeded, five-valved capsule. After flowering, the slender flower-stalk twists into a spiral curl, and, bending over, ripens the seed-vessel on the surface of the ground. On account of the graceful little flowers, this and other species of Cyclamen, are often found in cultivation. The tubers of C. Europæum (*Linn.*) and of C. Persicum (*Mill*) are also used, and the various species have been employed in medicine from an early period.

History.—Pliny and Dioscorides advised the root as a curative agent in numerous affections. It occupied a place in the *Pharmacopœia Londonensis*, 1653, under the name *Artanitæ cyclaminis*, and in *Lewis' Materia Medica* (1761), as *Arthanita*. It was officinal in Germany about one hundred years ago. The root is an orbicular, flattened tuber, brown externally, white within, with blackish radicles. It contains about eighty per cent. of moisture, and one-half per cent. of ash. The constituents are, saccharine matter, starch, gum, and cyclamin (*M. de Luca*), which is the poisonous principle of the tuber. To obtain *cyclamin*, extract the bruised fresh root with water, evaporate to the consistence of honey, exhaust with hot alcohol, evaporate, and upon cooling, the cyclamin will separate in small white crystals (*Saladin*); or the dried and powdered tubers may be exhausted with alcohol; filter this tincture, evaporate to dryness, extract the residue with alcohol, and then permit the solution, after filtration, to evaporate spontaneously in a cool, dark place. Whitish amorphous aggregations of cyclamin will be deposited, which may be purified by re-solution in hot alcohol, and subsequent evaporation over sulphuric acid.[1]

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[1] *Comptes Rendus*, 1857.

As obtained by M. de Luca, Cyclamin, $C_{20}H_{34}O_{10}$, is white, amorphous, opaque, inodorous, friable, neutral, and of an acrid taste. It absorbs moisture in damp air, becomes gelatinous in a small quantity of cold water, and dissolves in five hundred parts of this fluid, rendering the liquid frothy, like soap-suds. In aqueous solution it is coagulated by a temperature of from 140 to 170° F. (60 to 77° C.), but the coagulated matter redissolves after a few days. It readily dissolves in hot alcohol, acetic acid, wood spirit, and glycerin, but is insoluble in chloroform, ether, oils, and disulphide of carbon; tannin precipitates it from its solutions. When heated upon platinum foil it is dissipated, with decomposition and without residue; the action of boiling dilute acids upon it forms glucose, and a body called *cyclamiretin*. L. Mutschler concludes that cyclamin and *saponin* are identical, but we can scarcely accept the assertion, inasmuch as the therapeutical action of the two bodies are so different. Perhaps the tuber contains both saponin and cyclamin, to the former of which may be ascribed the frothy property imparted to water, and to the latter the poisonous action. Both cyclamin and the juice of the tuber are poisonous to man and fish, but the tubers are sought for and eaten by hogs with impunity, thus giving rise to the vulgar names applied to the plant, "sow bread," or "hog's bread."—L.

Properties and Uses.—The root or tuber of cyclamen, in its recent state, is a drastic cathartic, for which purpose it has been long in use among the peasantry of some parts of Europe; its effects, however, are frequently very severe, as violent emesis, hypercatharsis, intestinal inflammation, cold sweats, tinnitus aurium, spasmodic movements, etc., which some times result in death. This severity of action is lessened by drying the tubers. In the dried state, eight or ten grains of the powder, rubbed up with an equal quantity of starch or gum, will have a purgative effect. Formerly, an ointment was prepared from the fresh tubers, "ointment of arthanita," which was rubbed upon and around the umbilicus of children, for the expulsion of worms; upon the abdomen of adults to cause emesis, and upon the region over the bladder to increase the urinary discharge. The fresh tubers, bruised and formed into a cataplasm, have been employed as a local stimulating application to indolent scrofulous swellings, abscesses, etc. Cyclamin, one of the active principles of this plant, has not been employed therapeutically; administered to small animals, it has occasioned their death in a few days, their blood being found filled with vibriones.—K.

DIALYSIS.

Dialysis.

The name *dialysis* was applied, by Graham, to the act of separating certain bodies when in solution, by taking advantage of the fact that some substances pass more readily than others through certain gelatinous bodies. Those most diffusible, either crystallize or are closely related to crystalline classes, hence called *crystalloids*. The less diffusible are those incapable of crystallizing, usually prone to assume the gelatinous form, being distinguished as *colloids*. The principle of dialysis has, occasionally, for some years, been applied in practice, as in separating arsenious anhydrid, and other metallic poisons, from liquids containing organic matter, also in the separation of the crystallizable constituents of urine, as urea, etc.

A layer of gelatin will serve as a *dialyzer*, but a septum of animal membrane, such as bladder, or a piece of parchment, is better adapted to the purpose. The dialyzer is generally made by tying a sheet of parchment over a wooden hoop, or over a glass or rubber cylinder, or even over the wide open end of a funnel. The liquid to be dialyzed is then placed inside the vessel thus made, and the whole arrangement is permitted to float upon distilled water. In case the vessel is heavy, it is better to support it in such a manner that the surface of the liquid within the dialyzer will be a little above the surface of the surrounding water. This is necessary to prevent an excessive inflow of water, which, in some cases, renders the liquid very dilute before dialysis has progressed to any great extent.

We have found a pig's or a beef's bladder to make a very convenient and effective dialyzer. To prepare it, trim off all the superfluous fat, rejecting all the fleshy part of the neck of this organ; then wash it well in dilute ammonia water (one part of solution of ammonia to five of distilled water), and afterward rinse it well in water. The liquid to be dialyzed is now placed within the bladder, then this is strongly tied, and suspended in water. The inflow, or endosmosis, of water is more rapid than the exosmosis, and the outward pressure is considerable; therefore the precaution must be taken to thoroughly secure the opening, otherwise the string will be forced off. The process of dialysis has recently come into extensive use as a means of making the pharmaceutical preparation known as *dialyzed iron.*

FERRUM DIALYSATUM.

Dialyzed Iron.

The Paris Pharmaceutical Society (1876) adopted the following process: To one hundred grams (three and one-half fluidounces) of solution of ferric chloride, sp. gr. 1.245, thirty-five grams (one and one-fourth fluidounces) of ammonia water, sp. gr. 1.245, are slowly added, with constant stirring, and as soon as a clear solution has formed it is introduced into the dialyzer; the surrounding water, during the process of dialyzation, being frequently changed. When the contents of the dialyzer (as may be determined by testing a small portion from time to time) cease to precipitate a solution of nitrate of silver, and give no acid reaction, the operation is suspended. A given amount of the liquid in the dialyzer is now evaporated to dryness, the calculation made, and water added in such amount that one hundred grains of the solution shall contain five grains of solid residue.

Dr. W. H. Pile recommends the addition of solution of carbonate of sodium to the solution of chloride of iron, until a small portion of the resulting precipitate remains undissolved, and then to proceed with the dialysis. In this case, chloride of sodium passes through the septum. We believe the process now in general favor is to add freshly precipitated ferric hydrate to the solution of ferric chloride, until saturation ensues, and then dialyze the resulting liquid. In all cases the results of the operation are similar, and the solution within the dialyzer should, after the completion of the process, be brought to the proper standard by drying a given portion, and then, as heretofore stated, adding distilled water in sufficient quantity to make one hundred parts by weight of the solution to contain five parts of the dry residue.

Recapitulation.—When the foregoing basic solutions of oxychloride of iron mixed, as they are, with solutions of ammonium or sodium

chlorides, are placed in the dialyzer, the latter solutions pass through the membrane almost free from ferric salt. This can be exemplified by using glass vessels, when, throughout the distilled water, the descending currents of colorless denser solution will immediately exhibit themselves, by reason of the manner in which the various media refract the rays of light. Finally, the liquid within the dialyzer will be depleted of these ammonium or sodium salts to an extent sufficient to render the lower liquid identical in (crystalloid) composition with that within the dialyzer; then the process ceases. It will now be necessary to remove the water surrounding the dialyzer, and renew it with fresh portions, and this operation must be repeated as often as will be necessary. In practice, it will be noticed that rapidity of dialyzation depends, to an extent, upon this comparative (crystalloid) composition of the two liquids, and that in proportion as they approach each other in composition, the process slackens; therefore, frequent change of water is beneficial, and considerable depth to the lower liquid advisable. For this same reason, the process requires, toward its completion, a much longer time, proportionally, to remove a given amount of solution of crystalloids, for, although fresh distilled water may surround the dialyzer, there will be nearly an equilibrium existing between the crystalloids of the two fluids. From nine to fourteen days are generally required to complete the operation, but the process is influenced by the depth of the solution within the dialyzer, the extent of surface exposed, and the quality of the membrane employed, as well as by the attention given to a frequent change of the water in which the dialyzer floats. The most rapid work is accomplished with a constantly changing water below, and a thin stratum of liquid above, the membrane.

Properties.—Dialyzed iron has a deep-red color, and is miscible with distilled water, glycerin, and syrup. Fixed organic acids, alkalies, and salts, form with it a clear jelly. It is odorless and almost tasteless, merely imparting a slight rough sensation to the tongue. In composition, it is a very basic oxychloride, and, as found in the market, differs considerably in constitution. It is not, as some have supposed, a neutral solution of oxide of iron. Specimens that are neutral to litmus paper, and that fail to show the presence of chlorine upon simply adding nitrate of silver to the solution of iron will, as Professor Maisch has shown, give distinct precipitates, when a slight excess of ammonia water is previously added to the dialyzed iron, the mixture then filtered and the clear filtrate tested with solution of nitrate of silver.[1]

According to the analysis of Mr. Trimble (*Am. Journ. Pharm.*, 1878, p. 61), six specimens of commercial dialyzed iron varied in composition from $Fe_2Cl_6.11Fe_2O_3$ to $Fe_2Cl_6.31Fe_2O_3$. Neither specimen contained five per cent. of solid matter, the highest being 4.831 per cent., the lowest 2.514 per cent. The specific gravity of five per cent. dialyzed iron, according to Dr. W. H. Pile, is 1.029. Mr. E. B. Shuttleworth (*Canad. Pharm. Journ.*, 1877), states, however, that it is 1.034 if the evaporation of the solution tested has been conducted over an exposed water bath, and 1.040 when the perfectly dry residue is five per cent. If calcined, a residue of five per cent. indicates a solution of sp. gr. 1.046.[2]—L.

Properties and Uses.—Dialyzed iron has been presented to the medical

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[1]For exhaustive articles upon the subject we refer the reader to *Am. Journ. Pharm.*, 1877, 1878.

[2]If the process of dialysis is carried to excess, the resultant solution is prone to thicken. This is often observed in dialyzed iron where extra care has been taken that the process be carried to the utmost extent.—L.

profession as a remedy devoid of any styptic, disagreeable taste, producing no heart-burn, eructations, constipation, diarrhea, or gastric disturbance, occasioning no blackening of the teeth, and being a ferric solution in a form closely resembling that of the iron in the blood. It has likewise been recommended as an antidote for poisoning by arsenic, fully as efficient as the hydrated sesquioxide of iron. Its dose is from twenty to fifty drops daily, or from five to twelve drops repeated four times a day; it may be dropped upon a lump of sugar, or be taken in a little water, wine, or coffee. This preparation has been recommended in all cases in which the administration of iron is indicated, but it has not given general satisfaction among those who have employed it; and from what has been gathered from those who have tested it as an arsenical antidote, it certainly appears to be an uncertain and unreliable remedy. Professor Depaire, of the University of Brussels (*Journ. de Medecine de Bruxelles*, 1877) considers that this agent should be ranked among the least active of the ferruginous preparations. Bouchardat, of Paris, France, says: "Theoretically, dialyzed iron appears to me to be the most untrustworthy of the ferruginous preparations in which the ferric oxide occurs, and for two reasons: the iron called *dialyzed*, does not pass through the dialyzer, it must then be illy adapted for absorption: under the influence of very small quantities of alkali, of alkaline earths, of acids, of divers substances contained in the food, it becomes converted into an insoluble compound." Physicians in Germany frequently prescribe it as follows: Take of dialyzed iron, cinnamon water, each, fifteen fluidrachms, glycerin, alcohol, each, two and a half fluidrachms; mix. The dose of this for an adult, is a dessert spoonful, repeated three or four times a day. Each spoonful contains 2.14 grams (33 Tr. grains) of dialyzed oxide of iron, or 10 centigrams ($1\frac{1}{2}$ Tr. grains) of dry oxide of iron.—K.

DIOSCOREA VILLOSA.

Nat. Ord.—Dioscoreæ. The rhizoma of Dioscorea villosa, *Linn.*

Common Name.—Wild Yam.

ILLUSTRATION.—Our Plate VII—(rhizoma).

(See *American Dispensatory*, 8th ed., p. 335.)

Description.—This is an herbaceous, slender vine, found throughout the United States, but more common in the central and southern portions. The *stem* is a smooth green twiner, about the size of a goose-quill, twining from the right to the left, over fences, bushes, etc. The *leaves* are symmetrical and heart-shaped, gradually tapering to a sharp, acuminate point, and are borne on leaf-stalks from two to four inches long. The lower leaves are in whorls of four or five, with intervals of from six inches to a foot between, while those upon the upper part of the vine are irregularly alternate. The margins of the leaves are entire and wavy in the larger leaves. The veins are generally nine, quite prominent, and gradually diverge from the top of the leaf-stalk. The under side of the leaves is clothed with a thick pubescence. The *flowers* appear in June or July, are dicœcious, very small, and greenish-yellow. The male flowers are in compound loose spikes, with from three to five slender branches; the perianth is six-parted, sessile, flattened, and has, near the base, six minute stamens. The female flowers

are placed at intervals of one-fourth of an inch or half an inch apart, in simple, drooping, axillary spikes, consisting, each, of from four to eight flowers. The *ovary* is sessile, slender, about one-fourth of an inch in length, bearing at the summit a six-parted, small perianth, and three short styles. The female flowers are succeeded by dry, brown fruit, which remain hanging among the limbs of shrubs in winter for some time after the herbaceous stems of the plant have perished. They are sharply three-angled, and have three cells, each cell bearing two (or often, by abortion, one) flat membranous-winged seed.

DIOSCOREA VILLOSA (*Lin.*); *var. Glabra.*—This appears to us to be a distinct variety, chiefly differing from the preceding in the entire dissimilarity of its rhizomæ. The plant closely resembles the true wild yam in its general shape, and in the structure of its leaves, flowers, and fruit. The leaves, however, are *entirely glabrous* and are not covered with a short pubescence underneath. This distinction we have invariably found in every instance where we have examined the growing plants; hence, the under surface of the leaf will readily determine the character of the rhizoma. The two plants likewise appear to differ in their manner of growth, the *D. villosa* often growing in dense clumps, while the variety *glabra* is generally found isolated. From the specific name given to this plant, by Linnæus, it is evident that he was possessed of a specimen of the pubescent kind (or the true wild yam), and we have ventured to apply the designation, *var. glabra*,[1] to the variety distinguished by smooth leaves and knotty rhizomæ.

History.—The rhizoma of Dioscorea villosa is a favorite therapeutical agent among our Eclectic physicians, who have advantageously used it for more than forty years. It is known as *wild yam* and *colic root.* The first specimens employed were from the Dioscorea villosa, with pubescent leaves (*Fig.* 2, Plate VII), and is now known as the *true wild yam.* About the year 1850, botanic druggists noticed the admixture, by root-diggers, of the rhizomæ represented by *Fig.* 1, Plate VII, and for a considerable time rejected it as an adulteration. The diggers insisted, however, that both "roots" were obtained from vines almost identical in appearance (although they can distinguish between them), and finally purchasers were compelled to accept them, more especially as the true rhizomæ became very scarce. Mr. H. M. Merrell, of Cincinnati, Ohio, to whom we are indebted for this information, states that the first heavy shipments of the *false* "wild yam root" to Eastern houses were made about 1860, and which article purchasers refused to accept, but, after some correspondence, coupled with the fact that the true wild yam could not at that time be obtained, the parties concluded to receive it. Since then, the two rhizomæ have been sold indiscriminately, although but little of the original drug is to be found in the market. Eclectic physicians are aware of the difference between these rhizomæ, and refuse to use the "false" variety, insisting that it does not possess the medicinal properties, and can not safely be substituted for the "true." In this connection, we invite attention to the accurate engravings of each variety of the rhizomæ in Plate VII.

The rhizoma of *Dioscorea villosa* (Plate VII, *Fig.* 2) appears in market in slender contorted pieces from one-fourth of an inch to half an inch

[1]Works upon botany recognize only Dioscorea villosa, but it has become necessary to classify the two rhizomæ of commerce. Considerable attention has been given to the plants, and without an exception the form of rhizoma was indicated by the pubescence of the under surface of the leaf. I am, therefore, led to hold to the foregoing distinctions until a better explanation is given.—C. G. L.

PLATE VII.

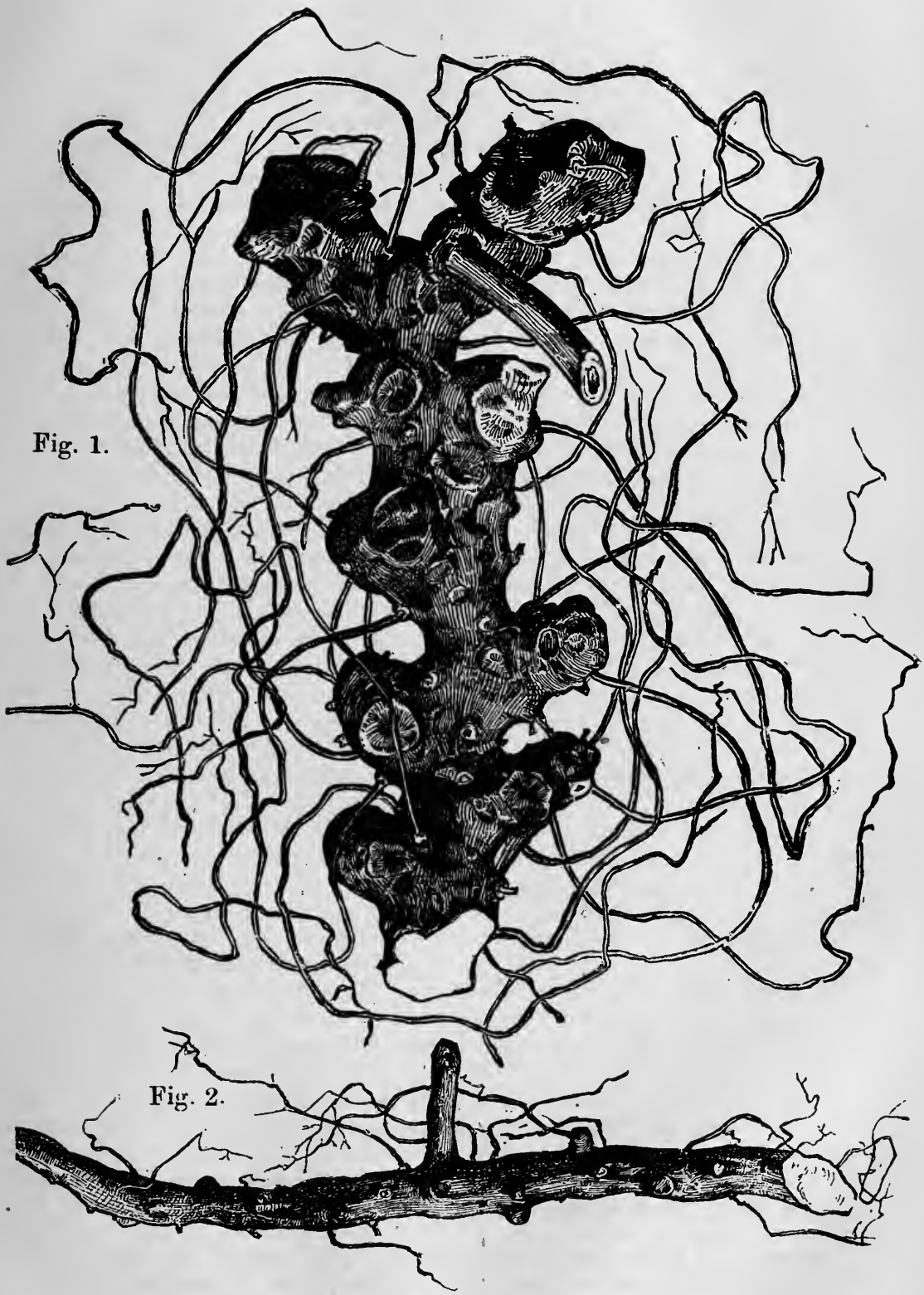

Fig. 1.

Fig. 2.

DIOSCOREA VILLOSA.

in diameter, and often two feet in length. It is oval, being flattened above and below as it creeps in a horizontal position beneath the surface of the ground. It seldom throws out branches, but, occasionally, little protuberances project from its sides, being from one-eighth of an inch to an inch in length, and about one-third as large, in diameter, as the primary rhizoma. They are rounding at the extremity, and seem to indicate an abortive attempt of the rhizoma to throw out branches; but they do not send up the vine. Along the upper side of the rhizoma are stem-scars, which are about three-fourths of an inch apart. The epidermis is brown, thin, and scales off, more or less, upon drying, especially when the rhizoma is gathered in the spring, but which is not the case with a good quality of it, when dug in autumn. The internal color of the dry rhizoma is whitish, or slightly straw-colored, when gathered in the autumn, but it is often brown when collected early in the season; there is no bark to it. Under a magnifying glass the texture of a broken rhizoma appears mealy and perforated with numerous woody bundles. Attached to the lower part of the rhizoma, an abundance of strong, wiry-like fibers will be observed. Dioscorea villosa has one of the firmest of rhizomæ, it being very difficult to powder or crush. It has no odor, and but little taste beyond a slight acridity after prolonged chewing. The virtues appear to reside in an acrid resin, almost insoluble in water, but readily extracted by alcohol. The so-called *dioscorein* is not a definite principle of the rhizoma, but is simply a dried solid extract, and to call it otherwise is a misnomer.

DIOSCOREA VILLOSA.—*Var. glabra.*

Description.—The rhizoma (Plate VII, *Fig.* 1) of this plant resembles that of *Collinsonia Canadensis* more nearly than it does the true D. villosa. It is found as a rough clump of a pound or more in weight when fresh, thickly-branched, each branch shooting from the side of the main rhizoma at an angle inclining backward and upward. The branches almost touch each other, are as large as the rhizoma, and are from one inch to three inches in length. Along their upper surface are numerous cup-shaped stem-scars, which are about one-fourth of an inch or one-third of an inch in diameter, and so thickly inserted as to intrude upon each other.[1] The diameter of the rhizoma and of the ramifications, is from half an inch to three-fourths of an inch, and the length seldom more than six inches. Internally, the rhizoma resembles that of the true wild yam, while the lower portion is, in like manner, covered with stout fibrous rootlets. The color is generally a very much darker brown.—L.

Properties and Uses—See *American Dispensatory*, 8th ed., p. 336.—K.

DUBOISIA HOPWOODII, *F. Muell.*

PITURY.

(See *Duboisia Myoporoides.*)

It has long been known that the natives of Central Australia use the leaf of some shrub in order to invigorate themselves, after long marches, or when they are desirous of undergoing great fatigue, as during a battle. This leaf is used by the Australians in a manner similar to that of the Coca leaves by the South Americans. The

[1] The vine of the true Dioscorea villosa, upon the contrary, springs from the *main rhizoma.*

source of the drug was unknown until 1877, when Baron von Mueller announced that he had, at last, obtained the leaves. According to the above authority, the Pitury is *Duboisia Hopwoodii* (*F. Muell.*), a shrub found sparingly "from the Darling River and Barcooto to West Australia." Staiger reports the discovery of an alkaloid, *piturin*, suggested by Wittstein as perhaps identical with *duboisin*. But little is known of this shrub, as it grows in a country difficult of access. Piturin is reported to antagonize the action of muscarine on the heart, but not so promptly as atropia. Dr. Bancroft states that this drug arrests the respiration of animals, and thus causes their death.—L.

DUBOISIA.

Nat. Ord—Solanaceæ. *Tribe.*—Salpiglossideæ, (Scrophularineæ. *Sub. Ord.*—Salpiglossideæ, *Benth.*)

The leaves of Duboisia Myoporoides, *R. Br.*

Description.—This is a large shrub, found in Australia and New Caledonia. It has alternate, smooth, entire *leaves*, narrowed into a short leaf-stalk, which is articulated to the branches. The *flowers* are small, white, and disposed in large terminal panicles. The *calyx* and *corolla* are five-parted, with obtuse lobes. The *stamens* are didynamous, with the rudiment of a fifth, and bear one-celled anthers. The *fruit* is a small, black, two-celled berry, which contains a few reniform, rough seeds. The genus *Duboisia* is intermediate between the Natural Orders *Solanaceæ* and *Scrophulariaceæ*, and was referred to the former by the older authors; Bentham, in the *Flora of Australia*, classes it with the latter, but recent developments regarding a natural constituent (duboisin) seem to indicate that its true place is among the Solanaceæ.

History.—The honor of introducing this drug to the profession belongs to Dr. J. Bancroft, of Brisbane, Australia, who presented the plant to Baron von Mueller for botanical identification, and who, at his suggestion, experimented with it as a therapeutical agent, and presented the first paper upon the subject to the Queensland Philosophical Society of Australia, in October, 1877. Shortly afterward, he (Bancroft) sent specimens of the plant to the Museum of the British Pharmaceutical Society. In March, 1878, Mr. C. M. Holmes read a paper before this society upon *Duboisia Myoporoides*, its botanical history, etc., and, nearly at the same time, a communication appeared in the *London Lancet* from Drs. Rigner and Tweedie, detailing a line of experiments upon its therapeutical action, in which the previous report of Dr. Bancroft was corroborated in every particular. Shortly afterward, Gerrard, of England, and Petit, of France, almost simultaneously announced the discovery of an alkaloid, since known as *duboisin* or *duboisina.*

DUBOISIN.—Is a volatile alkaloid, and, according to Wittstein, will probably be found identical with Piturin, an alkaloid found by Staiger in *Duboisia Hopwoodii.* It may be prepared by extracting ten parts of the leaves of D. Myoporoides, with hot water acidulated with sulphuric acid, evaporating this liquid to the consistence of syrup, then adding charcoal, in powder, one-twentieth the weight of the leaves, and carefully evaporating to dryness. The mass, reduced to powder, is now to be treated with twenty parts of hot alcohol; after cooling, one part of water is added, and the alcohol then removed by evaporation. To the remaining liquid add ten parts of cold water; permit the mixture to

stand for twenty-four hours, and then filter. To the filtrate add an excess of caustic potash, then distil. Saturate the distillate with sulphuric acid, and evaporate nearly to dryness. Agitate the residue well with absolute alcohol, and filter, evaporate the alcohol from the filtrate, pour the residuum into a glass stoppered bottle with a few pieces of caustic potash, and, after solution, add ether, agitate, decant the ethereal solution of *duboisin*, and evaporate spontaneously in a dry atmosphere. As thus obtained, duboisin is oily, straw-colored, lighter than water, and of a strong odor, intermediate between that of cantharides and that of nicotin. It is strongly alkaline, and completely neutralizes acids; is soluble in water, alcohol, and ether, in all proportions, likewise soluble in chloroform, benzol, and disulphide of carbon. According to the experiments of Gerrard, the important distinctions, chemically, between *duboisin* and *atropin* are as follows:

Duboisin is twice, or more times, as soluble in water. It will neutralize a larger quantity of acids. When in contact with cold sulphuric acid, it produces a reddish-brown color, while *atropin* remains unchanged When heated with sulphuric acid, duboisin gives an unpleasant odor, resembling that of butyric acid; while atropin evolves a pleasant aromatic odor. When boiled with hydrate of barium and water, duboisin evolves an unpleasant odor; that of atropin is pleasant. Duboisin turns the plane of polarization to the right; atropin appears to have no influence upon the ray of polarized light. Duboisin has not been crystallized.

The salt, *sulphate of duboisin*, is chiefly used in this country, at present. It is in the form of a soft gummy substance, of a pale-yellowish color, and very hygroscopic. M. Petit prepares the sulphate of duboisin as follows: Dissolve the extract of duboisia in the least possible quantity of water, and add to this bicarbonate of potassium until a decided reaction results. Agitate this with ether, which, by distillation, or evaporation, will leave the alkaloid under the form of a slightly-colored varnish. It may be rendered very pure by dissolving it in diluted sulphuric acid, and repeating the treatment with bicarbonate of potassium and ether. It is soluble in absolute alcohol, forming crystals, according to M. Petit, when left to spontaneous evaporation. He likewise states that the double chloride of gold and duboisin is readily obtained in crystalline state, thus enabling its elementary analysis to be made.[1]—L.

Properties and Uses.—The action of duboisia upon man and animals is very similar to that occasioned by belladonna. Dogs and cats to which it has been administered, almost immediately commence walking with difficulty, stumbling over the least obstacle, as though they were blind, and falling asleep as soon as they are left at rest, having the pupils largely dilated; these results also followed its introduction into the system by hypodermic injection. Large doses internally, or by subcutaneous injection, occasion large pupillary dilatation, dryness of the mouth and throat, increase the number of pulsations, and give rise to general debility, vertigo, and cephalalgia; the results are the same with man as with animals. The alkaloid, duboisin, produces similar effects. The sulphate of this alkaloid, subcutaneously injected in large doses, occasions a sort of intoxication, mental derangement, pupillary dilata-

[1] Since writing the above, Prof. A. Ladenburg, of the University of Kiel, who has been experimenting with the alkaloids, has proved that *duboisin* and *hyoscyamine* are actually identical, and that very probably *daturine* may also be included with them. *Berichte der Deuts. Chem. Gesell*, 1880, p 257.—L.

tion, inco-ordination of muscular motion, relaxation of the vesical and anal sphincters, and an increased temperature at first, succeeded by a very marked diminution.

As an internal remedy, neither the shrub nor its alkaloid have come into general use, though it is probable that used in this manner it will be found to possess properties similar to those of belladonna and its congeners. The alkaloid, duboisin, and its sulphate, are more commonly employed in this country, principally in ocular therapeutics; it has been found by Drs. Wecker and Galezowski, of Paris, to be a prompt and unirritating mydriatic, the mydriasis being accompanied with paralysis of the ciliary muscle, and, consequently, an absolute loss of accommodation. The mydriasis produced does not appear to annoy the patient, nor to last as long as when occasioned by atropia; nor does the employment of the agent give rise to the intense conjunctival irritations [follicular conjunctivitis and eczema of the lids] so often following the application of atropia. It may be employed in all maladies of the eyes, in which atropia is indicated; being contra-indicated in glaucomatous conditions, and in diseased conditions of the fundus. From two to four grains of the sulphate of duboisin are dissolved in one fluidounce of water, and of this solution from two to five drops may be instilled into one or both eyes, as required; the mydriatic effect commences in a few minutes. The solution of the sulphate of duboisin has likewise been successfully employed, by hypodermic injection, for checking the pathological sweatings common to phthisis, etc., and also as an antidote to poisoning by mushrooms, antagonizing the paralysing effect of muscarine on the heart. The dose to be used will differ with various individuals, from the one-sixtieth of a grain to the one-twentieth.—K.

ERIODICTYON GLUTINOSUM.

Nat. Ord.—Hydrophyllaceæ.

The leaves of Eriodictyon glutinosum, *Benth.* (*Syn.*—E. Californicum, *Benth.;* Wigandia Californica, *Hook.* and *Arn.*)

Common Names.—Yerba Santa, Mountain Balm, Consumptive's Weed.

ILLUSTRATIONS.—*Hooker's Bot.*, *Beech's Surv.*, Plate 88.

Description.—This plant is generally known as *yerba santa* (holy or sacred herb). It is shrubby, from two to four feet high, and is found growing in clumps, in dry situations throughout California, and northern Mexico, where it is very common in certain localities. The *stem* is smooth, branched usually from near the ground, and covered with a peculiar glutinous resin, which exudes abundantly from all parts of the plant, excepting the under side of the leaves. The *leaves* (*Fig.* 5), are thick, leathery, and evergreen, their upper surface being coated, somewhat like a varnish, with the aforementioned resin. They are alternate, and attached by short petioles at an acute angle with the branch. In shape they are narrowly elliptical, from two to five inches long, and from half an inch to three-quarters of an inch in width. They are acute, and taper to a short leaf-stalk at the base. The upper surface is smooth, and dark-green in color (sometimes black when dry). The under surface has a large, prominent mid-rib, and a close network of veins, and is covered, between the veins, with a close, white tomentum, which gives the surface a milky color. The margin of the leaf is

dentate, with numerous unequal teeth, which are undulate and blunt. The *flowers* are blueish, and borne in terminal clusters, which consist of from six to ten close, one-sided racemes, that unroll as the flowers expand. The *calyx* is hairy, about one-third the length of the corolla, and deeply five-parted, almost to the base. The *corolla* is broadly tubular, about half an inch long, and has five short, obtuse, spreading lobes. The five *stamens* are included in the corolla tube. The *pistil* consists of a free, ovate, hairy ovary, and two slender, diverging styles, with club-shaped stigmas.

Fig. 5.

Eriodictyon Glutinosum, *Benth.*
Natural Size.

History. — Eriodictyon was mentioned by Professor Maisch in March, 1875, at the meeting of the Phil. College of Pharm., a specimen of the plant being at the same time presented. The October *E. M. Journal* (1875), contained an article from Dr. J. H. Bundy, of California, upon "Yerba Santa." This was followed by others, all speaking of it as *Yerba Santa*. In February, 1876, Professor J. M. Scudder received specimens of the leaves from Dr. Bundy, and immediately had them identified botanically; they proved to be *Eriodictyon glutinosum*. Professor Scudder published the botanical name in the *E. M. Journal*, March, 1876, since which the plant has been generally recognized. The leaves are employed in medicine. They are fragrant even after long drying and exposure. Doubtless oxidation or other modifications of the various resinous substances continually develops this fragrant principle, which seems not to be a volatile oil. The taste is aromatic and sweetish, eventually acrid to a slight extent, but not bitter. The after-taste is sweet, resembling dulcamara, and is accompanied by a flow of saliva.

The first article of interest regarding this plant, from a pharmaceutical point, appeared in the *Chicago Pharmacist*, February, 1876, from Mr. H. S. Wellcome. He gives a figure of the plant, and reports finding several resinous bodies; but we are indebted to Mr. Charles Mohr for a thorough chemical examination of the plant,[1] the result being as follows:

Matter extracted by ether, 14.98 *per cent.* This consisted of "a bitter, acrid, brittle resin, 8 per cent.; inert green coloring matter, caoutchouc, wax in small quantity, and tannic acid in small quantity."

[1]Read at the meeting of the American Pharmaceutical Association, 1879, and published in the *American Journal of Pharmacy*, November, 1879.

Matter extracted by alcohol, after action of ether, 10.79 *per cent.* This consisted of "inert resinous matter, decolorized by animal charcoal; a peculiar glucoside of the tannic acid series predominating in the mass."

Matter extracted by water, after action of preceding menstruums, 18.42 *per cent.* This consisted of "tannic acid, similar to that above mentioned, gum, brown extractive, inert substance, and a trace of sugar." Wood fiber and ash, 43.31 per cent., and moisture 12.50 per cent. Upon distilling ten pounds of the dried leaves with water, Mr. Mohr found the distillate free from volatile alkaloid, but it contained a small amount of an oily substance, of an aromatic odor and taste, but utterly unlike that of the leaves.

We have prepared considerable amounts of the fluid extract of this plant (dried), and strongly favor alcohol as the best agent for extracting and permanently holding the proximate resinous principles in solution.—L.

Properties and Uses.—Eriodictyon (or Mountain balm) has been recommended in the treatment of laryngeal and bronchial affections, and in chronic pulmonary difficulties generally. It has also been eulogized in the treatment of asthma and hay fever, in combination with Grindelia robusta. That it possesses some efficacy in the treatment of chronic mucous affections of the respiratory passages, is undoubtedly true; but that it deserves the high encomiums passed upon it in the treatment of laryngo-bronchial and chronic pulmonary maladies, admits of great doubt; at least, the writer has met with no success with it in any of the above diseases that was superior, or even equal, to the results obtained by some of our old and well-known remedial agents. It has likewise been advised in the treatment of hemorrhoids, and in chronic catarrh of the bladder. The article is generally employed in the form of fluid extract, the dose of which varies from fifteen minims to a fluidrachm, taken in a little syrup, and repeating the dose every three or four hours.—K.

ERYTHROPHLŒUM.

Nat. Ord.—Leguminosæ. *Sub Ord.*—Cæsalpineæ. *Tribe.*—Dimorphandreæ.

The bark of E. Guineense, *Don.* (*Syn.*—E. judiciale, *Proctor.*)

Common Names.—Sassy bark, Mancona bark, Teli, Bondou, Bourane des Floupes.

ILLUSTRATION.—*Am. Jour. Pharm.*, Vol. XXIII.

Description.—Sassy bark is obtained from a large forest tree of Western Africa, and was first brought into notice by Prof. Proctor (1851), who referred it to the genus *Erythrophlœum* (*Afzelius*), and named it *E. judiciale.* Upon subsequent examination, Lindley identified it as the E. Guineense, *G. Don.* (Fillœa sauveolius, *Guill.* and *Perr*). The tree has a close resemblance, both in leaves and fruit, to the Gymnocladus Canadensis, or Coffee-nut tree of the United States. The *leaves* are bi-pinnately compound, and have ovate, acute leaflets, which are smooth, coriaceous, and alternate. The *flowers* are in dense, terminal, compound racemes; they are regular, and have a five cleft calyx, and five petals, imbricated in the bud; the ten stamens are distinct and perfect. The *fruit* is a thick, leathery, brown legume, containing from

three to five oblong, flat, albuminous seeds. The tree, when wounded, yields a red juice (whence the generic name), which, like the bark, is used by the natives as an ordeal, and as a poison for their arrows. The bark occurs in flattened, or more or less curved, pieces, of various sizes, of a reddish-brown color, somewhat similar to the color of hydrated peroxide of iron, and usually having an external corky covering, irregularly fissured; it is hard, friable, odorless, and astringent to the taste.

History.—Prof. Proctor, Jr. (1851), examined the bark, but failed to isolate the poisonous principle; he predicted its separation, and remarked that when found, it would "possess great activity," a prediction since verified by N. Gallois and E. Hardy, who, in 1876, succeeded in obtaining the alkaloid *erythrophlœin* and demonstrating, by experiment, its fatal action upon animal life.

Erythrophlœin is an organic base, and may be obtained by extracting the bark with alcohol slightly acidulated with hydrochloric acid, evaporating the tincture to a small bulk, exhausting this, when cold, with warm distilled water, evaporating the resulting solution, adding ammonia (or sodium carbonate) to the residue until it has an alkaline reaction, and then agitating the mixture with acetic ether, from which the alkaloid may be obtained by evaporation.

Erythrophlœin is amorphous, transparent, hard (like gum), of a light-yellow color, and soluble in water, acetic ether, alcohol, and amylic alcohol; only slightly soluble in ether benzine, and chloroform. It forms salts with acids; is very poisonous, acting upon and paralyzing heart. Curare, it is said, delays its effects.—L.

Properties and Uses.—Sassy bark furnishes a red decoction, which is used by the natives on the western coast of Africa as an emeto-cathartic, and as a test for the detection of criminals; should it purge, the person is considered guilty; but if it causes vomiting only, he is deemed innocent. The action of the bark has been investigated by Dr. T. Lauder Brunton and Walter Pye, Esq., in *Philosophical Trans.* of the Royal Society, Vol. 167, pt. II, and by Santos, Liebreich, and others. Used hypodermically, it is stated, to produce vomiting, but no catharsis. In large doses it occasions a progressive stupefaction, when administered to animals, with complete muscular relaxation, paralysis of the heart's action, and death. During the progress of these effects, there may also be observed a period of restlessness succeeded by vomiting, quickened and labored respiration, and finally convulsions. With man it is said to produce vomiting, vertigo, muscular relaxation, gradual cessation of the heart's movements, with dyspnea, convulsions, and death. The cause of its effects appear, according to investigators, to be owing to the fact that it contracts the blood-vessels, thus occasioning an increased blood pressure, resulting in the symptoms named. Therapeutically, it has been found efficient in those affections in which an agent was indicated, combining narcotic, astringent, and cholagogue properties, as in diarrhea, dysentery, passive hemorrhages, etc. It has likewise been suggested in dropsy, due to obstruction of the mitral valves. A tincture of the bark is probably the best form for administration, in doses of from two to five drops. Brunton and Pye consider the watery extract more powerful than the alcoholic. The powdered root is a violent sternutatory.—K.

EUCALYPTUS GLOBULUS.

Nat. Ord.—Myrtaceæ. *Tribe.*—Leptospermeæ.

The mature leaves of Eucalyptus globulus, *Labill.*

Common Name.—Blue Gum tree.

ILLUSTRATIONS.—*Bent.* and *Tri., Med. Plants*, Plate 109; our Plate VIII.

Description.—The genus, Eucalyptus, is noted as being an extensive and almost exclusively Australian family of trees; for although one hundred and thirty-four species are recorded by Bentham,[1] as natives of that continent, only two or three species are found to grow in any other lands. The Eucalyptus trees are very numerous in their native country, and constitute an important feature in every landscape. They are sometimes shrubs, but generally trees, which often attain gigantic size. Most of the species secrete a resinous substance, and hence are known to the Australian colonists as "gum trees." The *leaves*, which are always entire, are very variable in shape and position. In the young trees they are always opposite and horizontal, but, in older trees, they generally become alternate, and, by a peculiar twist of the leaf-stalks, present the edges instead of the flat surfaces to the ground, thus giving the Eucalyptus a strange appearance, different from that of any of our American trees. The *flowers* of the Eucalyptus trees are generally in umbellate clusters. The *calyx* is partially adnate to the ovary, and furnished in the bud with a conical lid or cap, covering the stamens, but which, when the flower expands, separates from the lower part of the calyx by a circular dehiscence, and falls off entire. There are no *petals*, but the *stamens* are numerous, and are sometimes united into four sets. The *fruit*, which is dry and enclosed in the hardened calyx, contains three or four cells, and usually ripens but two or three seeds to each cell.

The botanical history of the genus, *Eucalyptus*, is not yet thoroughly studied out; the leaves of the same species are, at different stages of their growth, extremely variable, and the species are so numerous and so closely allied, that positive specific differences are very difficult to find. The colonists classify them by the bark, which is either smooth, rough, or sometimes scaly.

EUCALYPTUS GLOBULUS.—This is one of the most valuable of Australian trees, on account of the timber, which is strong and durable. It is a large tree, often exceeding two hundred feet in height, and known to colonists as "blue gum," although this name is applied to at least six other species. The *Eucalyptus globulus* is placed, by Bentham,[1] in the series Normales, which have "perfect stamens with globular anther-cells, opening longitudinally." The *flowers* are large, sessile, and produced in axillary clusters of one to three. The mature leaves (Plate VIII) are from six to twelve inches long, and borne on wrinkled, twisted stalks, about an inch in length; they are narrowly lanceolate and falcate, with entire and thickened edges; they are obtuse or cordate at the base, and gradually tapering at the apex to an acuminate point. Their texture is very firm, so that the leaves retain their shape without wrinkles when dried. The veins are confluent near the margin. The entire leaf is thickly sprinkled with pellucid oil dots, and the surface, when dry, with minute black specks.

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[1] *Flora Australiensis.* [2] *Flora Australiensis.*

PLATE VIII.

EUCALYPTUS GLOBULUS.

History.—The leaves of Eucalyptus globulus constitute, in Australia and adjacent countries, the popular remedy against fevers, and especially in obstinate palustral fevers; they are firm, coriaceous, and in the green state resist the attacks of grasshoppers and locusts. They have a strong, agreeable, aromatic odor, and a warm, bitterish and aromatic taste, which, as with peppermint leaves, is followed by a cool sensation in the mouth. The leaves have been analyzed by Cloez, Faust, and Homeyer, M. F. A. de Hartzen, and Prof. E. S. Wayne. According to Cloez, they contain tannin in quite a large proportion, resinous matter, and an essential oil.

VOLATILE OIL OF EUCALYPTUS GLOBULUS.—When the leaves are distilled with water, a fragrant, yellowish oil is obtained, which becomes brown and resinous, from oxidation, when exposed to the atmosphere. The flower buds yield this oil in great quantity, and even when dry are found to contain numbers of large oil glands filled with oil. In 1870, Cloez examined the oil, and decided its principal constituent to be a higher homologue of camphor, boiling at 175° C. (347° F.), of the composition $C_{12}H_{20}O$; he named it *eucalyptol*. Poehl found eucalyptol to have the property of converting water, exposed to the influence of air and sunlight, into hydrogen dioxide, or to change oxygen into ozone.

Faust and Homeyer, in 1874, found this substance to be a mixture of terpens and cymol. Homeyer (1876), in experimenting with another lot of oil, obtained results contrary to those given above. The oil, when distilled, separated into two parts; one, the largest portion, boiling below 186° C. (366.°8 F.); the other boiling above 200° C. (392° F.). It is not by any means certain that these gentlemen experimented with identical substances; indeed, the probabilities are to the contrary, inasmuch as portions of the oil are constantly undergoing more or less chemical alteration. As summed up by Wright, "Eucalyptus oil appears to have a composition closely resembling that of oil of nutmeg, viz.: consisting of two terpenes, cymene, an oxidized body of the formula $C_{10}H_{14}O$, with more or less resinous substances." Oil of Eucalyptus globulus is of specific gravity 0.917 at 59° F., boils at 149°–177° C. (300°–351° F.). As made by us, it has a pleasant cajuput-like odor, a cooling, mint-like taste, is thin and pale-yellow, and dissolves resins readily, but does not dissolve gutta-percha. The oils of various species of Eucalyptus differ in many respects. Of late years, the manufacture of Eucalyptus oil has been established in Australia, and it is now an article of commerce.

OTHER CONSTITUENTS.—Rabuteau failed to discover a basic principle after having freed an alcoholic extract of the leaves from oil, tannin, and resin. H. Weber found a white crystalline body, mixed with an amorphous resinous mass, both of acid reaction; an acid yellow resin, of bitter taste; an acid named *eucalyptic acid;* and a neutral, crystallizable, bitter substance, soluble in ether and alcohol, and only slightly soluble in water. Prof. E. S. Wayne obtained a crystallizable acid resin capable of producing, with ferric chloride, a brown-red reaction.—L.

Properties and Uses.—Eucalyptus globulus has for a long time been known as a remedy for intermittent fever among the natives of the countries of its origin. It is stated that more than forty years ago the corvette, "La Favorite," being in the vicinity of Botany Bay, had her crew nearly decimated by a pernicious fever, and that a perfect recovery ensued among those remaining upon using an infusion of the leaves of Eucalyptus; the credit of this discovery is given to Dr. Eydoux, and M. de Salvy. Dr. Ramel, of Valencia, is said to have introduced the

remedy into Europe, in a statement made to the Academy of Medicine, in 1866; since which period its therapeutical virtues have been examined by many investigators. The emanations from this tree have, it has been reported, a strong antagonistic influence against those conditions termed malarial, and, on this account, it has been cultivated in various places in Europe where these conditions appear to have had a permanent existence.

Notwithstanding the high encomiums passed upon this agent as an antipyretic by the majority of those who have tested it, there are certain other investigators who are less enthusiastic; thus, Dr. Burdell, who tested its efficacy in the fevers encountered in the marshy district of Sologne, France, states, that though eucalyptus has been sometimes found a febrifuge nearly equal to quinine; at other times it has proven to be discouragingly inefficacious. (Indeed, the same may be observed of quinine and all other remedies.) He states that the cures effected by it have been more frequent in the hospital than in the palustral localities, and which may be readily accounted for. Very often, as Chomel has shown, persons attacked with intermittent fever are cured in the hospital without any medicines having been employed. Dr. Carlotti, of Ajaccio, considers a quickly made decoction of the leaves to be of great value in those cases of intermittent fever that do not yield to quinia; he gives the decoction in doses of from two to five fluidrachms.

Aside from its utility in intermittents, this agent has had other virtues attributed to it, as follows: The leaves have been successfully used as a tonic and gently stimulating stomachic, in atonic dyspepsia, and in catarrh of the stomach; also advised in mucous catarrhal affections generally; in psuedo-membranous laryngitis, and in chronic bronchitis, with or without emphysema; it has likewise proved efficacious in chronic catarrh of the bladder, where the urine is high colored, contains an abnormal amount of mucus, or, perhaps, some purulent matter, and micturition is attended with much pain. Recently, it has been recommended as a diuretic in the treatment of dropsy. Both the leaves and the oil are excitants and deodorizers, and, as such, have been successfully employed as local applications in bronchial affections with fetid expectoration, in ozœna, in fetid or profuse mucous discharges, in vaginal leucorrhea, gonorrheal discharges, indolent, fetid wounds or ulcers, in septicemia, and in gangrene. M. Bucquoy has found it to exert a happy influence in the treatment of pulmonary gangrene. M. Luton, and others, have derived considerable benefit from it, when locally applied in cancerous affections, in the form of a compress of lint moistened with the tincture. It has likewise been advised to prevent putrefaction of organic substances, and to deodorize sick rooms, and apartments containing unhealthy air. The leaves may, in some cases, be applied alone, directly to the part, in form of cataplasm; or they may be combined with other articles to form a poultice. The oil may be applied of full strength, or diluted with some other agent. In throat and pulmonary maladies, a tincture diluted, or a medicated water, may be inhaled in the form of spray; if the oil be employed, it may be dropped on some cotton placed in a small tube, from which the vapor may be inhaled. As a deodorizer, the tincture or the oil may be sprinkled or sprayed upon the offensive body, or the atmosphere of an apartment may be frequently sprayed with the same.

The oil (eucalyptol), in small doses, is a gentle stimulant; in large doses, it occasions irritation of the throat and fauces, with increased flow of saliva; cephalagia, with extreme fatigue; frequency of the

pulse; increased temperature; diminution of vascular tension; gastric irritability, and, not unfrequently, diarrhea, accelerated respiration, the peculiar odor of the oil being exhaled with the breath; and increase of the urinary excretion. Its chief eliminatory organs appear to be the lungs and kidneys, causing an increased elimination of urea. The dose of the oil is from two to five drops, and it is more convenient to administer it in capsules. One part of the oil combined with one hundred parts of cod-liver oil has proved serviceable in phthisis; it removes the offensive taste and odor of the fish oil.

The most agreeable and convenient form of administration is the tincture, in doses of ten to twenty drops; or, the fluid extract, in doses of six to ten drops, in syrup. The leaves made up into cigars or cigarettes, and smoked, have been advised, to afford relief in bronchial catarrh, asthma, and other affections of the respiratory organs; the question has been asked, may not the small amount of benefit that might be derived from the minute proportion of oil remaining intact, be more than overcome, and even prove injurious, from the irritating action of the smoke and of the empyreumatic products?—K.

FERRI BROMIDUM.

Bromide of Iron.

Formula, $FeBr_2$; molecular weight, 215.40.

Description.—Bromine combines directly with iron, to form bromide of iron, represented by the above formula and molecular weight. When the two elements are placed together, the chemical reaction is violent, with evolution of heat, and large amounts of bromine are lost by evaporation. For this reason, precautions must be taken to control the reaction. Theoretically, fifty-six parts of iron are sufficient for one hundred and sixty parts of bromine; yet, in practice, it is advisable to use a larger proportion of the former. The following process is practical, and we recommend it to those who desire to prepare bromide of iron in a small way; with a few modifications, it may be adapted to the preparation of solution of bromide of iron in quantities sufficient for the manufacture of bromide of potassium:

Into a chemical flask introduce two fluidounces of distilled water and one troy ounce of clean coarse iron turnings, or iron wire, and surround the flask with ice and water; now add half an ounce (troy) of bromine, and agitate occasionally, until the solution has almost lost its red color; to the solution, when cold, again add a like amount of bromine, and, when the reaction is finished, add another half ounce (troy) of bromine, and so continue successively until a total of two troy ounces of bromine has been used; after each addition, permit the reaction to cease, and the liquid to cool. Now warm the flask, and, when the solution has acquired a greenish color filter over; wash the excess of iron and the liberated carbon [the carbon is from the iron] with a little distilled water, and filter into the former solution. Transfer this solution at once into a clean iron dish, placed upon a sand bath, and quickly evaporate, until a portion, removed upon a glass rod, will solidify upon cooling; then remove the dry salt, immediately, into well-stoppered bottles.

History.—When bromine is added to iron, surrounded by ice-water, combination ensues without material loss of bromine, unless the pro-

portions are in larger amounts than our formula directs, or unless the mixture is permitted to become warmer than an ice-cold water-bath will allow. When the reaction is completed with the first portion of bromine, the solution of bromide of iron possesses the power of dissolving bromine, and, consequently, the following portions of bromine are dissolved and diluted, thus modifying the chemical action. Solution of bromide of iron absorbs oxygen with avidity and the most rapid evaporation will not entirely prevent it. Bromide of iron is of a grayish-black color, acquiring a rusty color upon exposure.

SYRUP of BROMIDE of IRON, has of late come into some little demand, and may be made by filtering the solution of bromide of iron, as prepared by the preceding formula, into sixteen fluidounces of simple syrup, and, after washing the paper and excess of iron and liberated carbon with a little distilled water, adding enough simple syrup to the mixture to make the whole measure twenty fluidounces. Several and varying propositions have been suggested for this preparation, but the strength we have adopted seems to be the best, as it produces a syrup similar to the officinal syrup of iodide of iron, bromine being substituted for iodine. Syrup of bromide of iron has a greenish color when recent, somewhat resembling, in appearance, that of syrup of iodide of iron, and, like this preparation, it decomposes by age. Each fluidounce contains about sixty-five grains of bromide of iron.—L.

Properties and Uses.—Bromide of iron is an uncertain and poisonous agent, and if employed at all internally, it should be with the greatest caution. It is highly probable that the iron furnishes but a very minute amount of any therapeutic value it may possess; and the constant tendency to decomposition renders it an undesirable agent. It is stated to have proved efficacious in scrofulous and tuberculous diseases, in glandular enlargements, in some cutaneous affections, in muscular hypertrophy, erysipelas, leucorrhea, spermatorrhea, bronchocele, amenorrhea, and even in phthisis. It is given internally in the form of syrup, in doses of a half a fluidrachm to a fluidrachm, and the solution is also applied locally, by means of a camel's hair pencil, or a feather, to the external maladies. Its virtues, if any, are undoubtedly due to the bromine present; on this account, some other of the bromides that may be safely administered should be employed when a bromide is indicated; and, should iron be also indicated, it can be given separately. Bromide of iron is considerably employed in the manufacture of bromide of potassium.—K.

GALANGA.

Nat. Ord.—Zingiberaceæ.

The rhizomæ of Alpinia officinarum, *Hance.*

Common Names—Colic root, East India root, Galangal.

ILLUSTRATION.—*B.* and *T. Med. Plants.* No. 271.

Description.—The plant that yields galangal was described by Mr. H. F. Hance, in the *Journal of the Linnæan Society*, 1871. The plant was obtained from Hainan, an island directly south of China, but it also doubtless grows on the adjacent mainland, as the root is largely exported from Shanghai and other China ports. The *stem* is from two to four feet high, erect and bears a close resemblance to the common cultivated Canna, or shot-plant. The parallel veined *leaf-blades* are about a foot long, two to four inches wide, smooth, entire, and sharply acumi-

nate. They are attached at the base to a scarious margined sheath, which clasps the stem. The *flowers* are borne in a terminal dense spike; they consist of a short, tubular, superior calyx, a white corolla with three lobes, a large ovate lobellum marked with red veins, a single anther-bearing stamen and a pistil with an inferior ovary and a slender style.[1]

History.—The galangal of commerce is known as Lesser Galangal; another variety, known as Greater Galangal, is rarely found in the market. It is the product of *Alpinia Galanga* (*Willd.*), and grows in Java. The name *galangal* is said to be derived from the Arabic *Khanlanjan*, which, in turn, is perhaps the perversion of a Chinese word, signifying *mild ginger*. Galangal has long been an article of commerce with Eastern Nations, and has been known in Northern Europe since the twelfth century (*Hance*). The rhizomæ, as found in market, are in sections of from one inch to four inches in length, and of a reddish-brown color, as though covered with rust. The cut ends are usually rounding, while the edges expand outwardly and turn back. Each fragment has, generally, one or more short branches, and it is evident that the roots are taken from the ground in masses, and chopped into pieces. Encircling them, at intervals of from one-eighth of an inch to half an inch apart, are corrugated rings of a light color, consisting of adhering bases of leaf-sheaths. The roots are stout, and break with a granular fracture presenting a brownish-grey color, interspersed throughout which are small ligneous fibers. These fibers project a short distance beyond one surface of the root, thus leaving depressions upon the opposite side, resembling pin-holes; the center of the root, for about from one-fourth to one-third of its diameter, consists of a bundle of these fibers. Galangal reminds us of ginger, and imparts a pungent taste and an aromatic odor, very similar to that article. In this country, galangal has not come into use among physicians, but is extensively sold by street-corner venders under such names as "colic root," "the wonderful East India root, etc.," and is asserted by them to be a certain cure for toothache, headache, etc. The constituents of galangal are similar to those of ginger. A volatile oil is obtained by distilling the root with water, which, in appearance and smell, resembles cajuput oil. It is soluble in alcohol, and is lighter than water. A soft resin, having a pungent taste, is extracted by ether, and also a peculiar crystalline substance, named by Brandes, *kæmpherid*, which is obtained by evaporating the ethereal extract, then exhausting the residue with alcohol, filtering, and evaporate the filtrate to crystallization. Thus kæmpherid is obtained in "light-yellowish lamellæ, of mother-of-pearl luster" (*Wittstein*). It is almost insoluble in water, soluble in twenty-five parts of cold ether, and in fifty parts of cold alcohol; is soluble in caustic alkalies without change, and is decomposed by concentrated sulphuric acid. The other constituents are unimportant.—L.

Properties and Uses.—Galangal is a stimulating aromatic, and has been successfully employed to aid the digestive process, preventing fermentation and removing flatus. It will be found especially useful in some forms of dyspepsia, preventing vomiting or sickness at stomach, and facilitating digestion. It may be used in all cases in which a stimulating aromatic is indicated. Its best form of administration is in tincture, the dose of which is from half a fluidrachm to a fluidrachm. It is rarely prescribed at the present day.—K.

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[1] *Bent.* and *Trimen. Med. Plants.*.

GALEGA.

Nat. Ord.—Leguminosæ. *Sub. Ord.*—Papilionaceæ. *Tribe.*—Galegeæ.

The herb of Galega officinalis, *Linn.*

Common Name.—Goat's Rue.

Description.—This is an herbaceous plant, native of Southern Europe. It has an erect, perennial, glabrous *stem*, about three feet high, and is found growing mostly in sandy soil. The *leaves* are alternate, oddly pinnate, and furnished at the base with lanceolate stipules. The *leaflets* are smooth, lanceolate, and terminate in a mucronate point. The *flowers* appear in June and July, are blue, and borne in loose, axillary racemes longer than the leaves. The *calyx* has five narrow, equal lobes. The *corolla* is papilionaceous with an obtuse keel. The *stamens* are united into one set, the filament of the tenth, however, is distinct for about one-half its length. The *fruit* is a dry, round, smooth, many-seeded legume.

TEPHROSIA VIRGINIANA (*Pers.*), a plant formerly referred to the genus Galega, is a native of the United States, and the root, which is slender and very tough, is reputed to be an anthelmintic. We can not find that either of the aforenamed plants have been examined chemically.—L.

Properties and Uses.—Galega has a disagreeably bitter taste, and, upon being chewed, imparts a dark-yellowish color to the saliva. Various properties were attributed to it in former times, in which it was considerably employed as a vermifuge, as a stimulant to the nervous system, as a diuretic, and tonic in typhoid conditions, and it is also stated to have been of service in the plague, as well as to stimulate the lactiferous vessels to an increased secretion during the period of lactation. It is seldom, if ever, prescribed in practice.

Tephrosia is referred to in *King's American Dispensatory*, 8th edition, p. 826.—K.

GENISTA.

Nat. Ord.—Leguminosæ. *Sub. Ord.*—Papilionaceæ. *Tribe.*—Genisteæ.

The young branches and leaves of Genista tinctoria, *Linn.*

Common Names.—Dyer's Green-weed, Wood-waxen.

Description.—This plant is an erect shrub, about a foot high, and is a native of Central Europe. It is quite common in poor soil throughout England, and has been naturalized, and grows abundantly, in a few localities of the Eastern United States. The *stem* is short, woody, and sends up numerous erect branches. The *leaves* are simple, a character distinguishing the plant from most of the native leguminous plants. They are narrowly lanceolate, acute, entire, sessile, alternate, and attached to the stem at an acute angle. The *flowers* are numerous, bright-yellow, and are borne in terminal, showy racemes. The *calyx* is two-lipped, with a deeply two-lobed upper, and a three-lobed lower, lip. The *corolla* is papilionaceous, and the ten stamens are united into a complete tube at the base. The *fruit* is a flat, several-seeded pod.

History.—There are three English species of Genista, two unarmed; *G. tinctoria*, with smooth, and *G. pilosa*, with hairy, leaves. The armed species, *G. anglica*, has sharp, simple thorns. The leaves of *G. purgans*, a native of France, are used as a cathartic.

Little is known of the chemical history of the several species of *Genista.* Genista tinctoria has been in some little repute as a medicine since the day of Culpepper. The flowers yield an inferior yellow dye. The dried plant possesses scarcely any taste. It must not be confused with "Broom tops," Scoparius.—L.

Properties and Uses.—Both the flowers and the seeds have been employed in medicine, in dropsical affections, and with considerable efficacy. Sixty grains of the powdered seeds, produce active catharsis, and even emesis, and is the dose generally advised in dropsy. An infusion of the flowers has been advantageously employed in gout and rheumatism, and is also stated to have been successful in several cases of albuminaria, in doses of two tablespoonsful every hour or two. Probably, a tincture would be found more available, should the drug again come into general use. In former years, this plant had an unmerited reputation for the prevention, as well as the cure, of hydrophobia.—K.

GENTIANA QUINQUEFLORA.

Nat Ord.—Gentianaceæ. *Sub Ord.*—Gentianeæ.

The root of Gentiana quinqueflora, *Lam.*

Common Name.—Five flowered gentian.

ILLUSTRATION.—*Bot. Mag.*, Plate 3,496.

Description.—This is an annual plant, found in wood-land pastures and other open situations in the Eastern section of the United States. The *stem* is smooth, erect, four-angled, and from one to two feet high. The *leaves* are opposite, entire, sessile, slightly cordate, clasping the stem at the base, and acute at the apex. They are about an inch long, and have from three to five veins proceeding from the base. The *flowers*, which appear late in summer, and open only in sunshine, are of a bright-blue color, and erect. They are borne in loose panicles, in axillary and terminal clusters of three to five, on pedicels shorter than the flowers. The *calyx* is about one quarter the length of the corolla, and is deeply five-parted, having very narrow, linear lobes. The *corolla* is smaller than in the other native species of Gentiana, being slightly less than an inch in length. It is narrowly bell-shaped, and has five, acute, short lobes. The *stamens* are five, and attached to the corolla tubes; they have versatile anthers, which are introrse when the flower expands, but at length turn away from the pistil. The *pistil* consists of a one-celled ovary, supported on a slender stipe, and bears two distinct, sessile stigmas. The *fruit* is a dry capsule, opening by two valves, and filled with very numerous small seeds. The plant above described is the form of Gentiana quinqueflora occurring in the Eastern section of the United States. A Western variety (*var. occidentalis. Gray*) differs, in being more-robust, and in having the calyx-lobes half the length of the corolla; it occurs in the prairies of Illinois, and throughout the neighboring States, and southwardly.

History.—This plant was recently recommended as a substitute for quinine, the root being employed. As found in the market, under the above name, it is about the size of senega, has the general appearance of this root, excepting the angled form and ridge. It has a smooth bark, which is light-yellow externally, and white within. It breaks with a clear fracture and is hard and woody. The taste is very bitter,

resembling the Apocynums rather than Gentiana lutea. It has never been chemically examined.—L.

Properties and Uses.—See *King's Am. Disp.*, 8th ed., p. 384.

GRATIOLA.

Nat Ord.—Scrophulariaceæ. *Sub Ord.*—Antirrhinideæ. *Tribe.*—Gratioleæ.

The plant and root of Gratiola officinalis, *Linn.*

Common Name.—Hedge-hyssop.

Description.—The genus *Gratiola* is composed of small herbs less than a foot high, and found growing in low, damp situations. They all possess bitter properties, and cattle refuse to eat them. They have opposite, sessile *leaves*, and small, axillary *flowers*. The *calyx* is sub-equally five-parted, and the *corolla* tubular and bilabiate. The *stamens* are two, and there are often two or three sterile filaments. The *fruit* is a dry, many-seeded, two-celled capsule opening by four valves.

GRATIOLA OFFICINALIS (*Linn.*), is a native of Europe, and has a smooth, four-angled *stem*, and lanceolate, three or five-nerved *leaves*. The *corolla* is pale yellow, and striped with light-purple. The calyx lobes are often seven. This species has long been used as a medicine in the south of Europe, and was mentioned by Lewis in his Materia Medica (1761), under the names *Gratiola centaurioides*, *Gratia dei*, hedge-hyssop, and herb of grace.

GRATIOLA VIRGINICA (*Linn.*), is the most common indigenous species, and is found in large patches in damp soil. It is a small, much-branched plant, with an erect glutinous *stem*. The *leaves* are lanceolate, dentate, and clasping. The *flowers* are very numerous, with small, white corollas variegated with yellow, and pubescent in the throat. The other indigenous species of Gratiola, are mostly found in the Southern States.

History.—Nothing is known about the chemical constituents of the indigenous species, but they are probably similar to those of G. officinalis. Vauquelin (1809) published an analysis of *Gratiola officinalis*, having found in it a bitter resinous substance, an acid in combination with lime and soda, believed by him to be malic or acetic acid, and various earthy salts and principles common to plants. Marchand[1] proved the resin of Vauquelin to be a compound, identifying tannic acid and a white bitter crystallizable substance, to which the name *gratiolin* was given. Afterward, Walz proved *gratiolin* to be a glucoside, and obtained, in addition, another glucoside, *gratiosolin*, and an acid named by him *antirrhinic acid*, to which the name *gratioloic acid* is now applied.

GRATIOLIN is one of the bitter principles of Gratiola officinalis. It is a white powder, crystallizing from alcohol in warty masses, and from water in silky needles. It is soluble in 893 parts of cold water, and in half the amount of boiling water, and is less soluble in ether. Alcohol is its best solvent. It decomposes upon boiling with diluted sulphuric acid, yielding sugar and other products.

GRATIOSOLIN is a glucoside, amorphous, bright-red in mass, friable, and of a bitter taste; it is soluble in seven parts of cold, and five parts of boiling, water; in about half the amount, respectively, of hot and cold alcohol. Diluted acids and alkalies split it into sugar and another

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[1] *Journ. de Chim. Med.*, 1845, p. 518.

product. The chemical constituents of Gratiola officinalis are of little practical value, as the infusion, or tincture, or plant in substance, are alone used in medicine.—L.

Properties and Uses.—Hedge-hyssop is rarely, if at all, used in this country. In Europe it has been employed as a hydragogue-cathartic in the treatment of dropsical affections, in doses of from ten to thirty grains of the powdered root. Its use is frequently followed by emesis and diuresis. In smaller doses, it has been advised in chronic affections of the liver, in jaundice, and also in certain melancholic forms of insanity. It is an active agent, and should be administered with judgment. An infusion of four drachms to a pint of boiling water, may be given in half-fluidounce doses. Probably a tincture of the root might be useful; but every indication for this agent can be fulfilled by one of our indigenous plants, as podophyllum, iris, euphorbia, apocynum, etc.—K.

GRINDELIA.

Nat. Ord.—Compositæ. *Tribe.*—Asteroideæ.

The mature leaves and flower-heads of G. robusta (*Nutt.*), and G. squarrosa, *Dunal.*

Common Name.—Hardy Grindelia.

Description.—Grindelia robusta is an erect perennial plant, native of California. It has a smooth, round, striate *stem*, much divided into ascending branches, each of which ends in a large, yellow flower-head. The lower *leaves* are obovate-spathulate, and tapering at the base; the upper are alternate, ascending, and have broad clasping bases. They are of a firm, coriaceous texture, and a light-green color; the margins are coarsely toothed. The *flower-heads* are large, nearly three-quarters of an inch in diameter, and are solitary, terminating the branches. The involucre is very resinous, and consists of many thick, imbricated scales, with recurved tips. The receptacle is flat, pitted like a honeycomb, and destitute of scales. The ray-flowers are large, yellow, spreading and arranged in a single series. They are pistillate and fertile. The disk-flowers are very numerous and perfect. The achenia are smooth, oblong, and slightly four-angled. The most distinguishing character of the genus Grindelia is the pappus, which consists of three or four very deciduous awns; they are rigid, more or less curved, white, very smooth, and, when magnified, have a waxy appearance. In the G. robusta they are about half the length of the disk-flowers. A very large variety (*var.* latifolia) of this species of Grindelia is frequent in California and is often collected. It is much more robust in every particular, having heads over an inch in diameter. The upper stem-leaves are about an inch broad, and the flower-heads are surrounded at the base by a cluster of three or four leaves.

History.—This plant was brought to the notice of pharmacists and the medical profession generally, by Mr. Jas. G. Steele, of San Francisco, California, through a paper presented to the American Pharmaceutical Association, in 1875, although Dr. C. A. Canfield, long previously, had noticed it in the *Pacific Medical and Surgical Journal.* The dry plant contains a large amount of resin, and, when distilled with water, yields a trifling amount of a peculiar volatile oil, which, however, differs in odor from the plant. Its therapeutical properties undoubtedly depend upon the resinous substances; as the endeavors of the

writer to obtain, from practitioners, a favorable report concerning a tincture or an extract from it, but devoid of such principles, have failed. Alcohol is the proper menstruum for extracting the characteristic principles of the plant, and with alcohol, a *black* or *dark-red* fluid extract or tincture can not be prepared. Grindelia robusta, as found upon the market, is often mixed with other species of Grindelia, especially G. squarrosa.—L.

Properties and Uses.—Grindelia robusta has been found especially efficacious in asthma, giving prompt relief, and effecting cures in cases previously rebellious to medication. Occasionally, however, as is, indeed, the case with all therapeutical agents, it has failed, but the circumstances attending these failures have not yet been determined. Farther investigations regarding its action in this disease, and the cause of its occasional failure, are required. It has likewise been found efficient in bronchial affections, in pertussis, and in some renal maladies. The fluid extract is the preparation generally employed, the dose of which is from ten to sixty minims, repeated three or four times a day, as may be required. Children require doses of from five to fifteen or twenty minims.—K.

GRINDELIA SQUARROSA.

Common Name.—Scaly Grindelia.

Description.—Grindelia squarrosa has the general appearance of Grindelia robusta (see page 99), but is a smaller plant, and has lately been considered a variety of this species. It is more widely distributed than G. robusta, and is quite common on the plains, from the Rocky Mountains west to the Pacific. The mode of growth is different in the two species. In the Grindelia squarrosa, a perennial root-stalk sends up, from its head, a cluster of from four to ten slender, erect, sub-parallel, and generally undivided branches, from one to two feet high. The *stem-leaves* are alternate, acute, sessile, and slightly clasping at the base, and serrate on the margin. They are about an inch long, one-quarter as wide, and are attached to the stem in an erect position. The scales of the flower-heads are narrow, and have long, slender, recurved points (whence the specific name). In other respects the flower-heads resemble those of the Grindelia robusta, but are smaller. The pappus of the Grindelia squarrosa is slender and about the length of the disk-flowers. Grindelia squarrosa was introduced as a remedial agent some years after Mr. Steele brought G. robusta into notice. Its sensible properties are exactly like those of G. robusta, and it is often found on the market and substituted largely for G. robusta.—L,

Properties and Uses—Grindelia squarrosa has been highly eulogized as an efficient remedy in intermittent fever, and in other malarial affections, also to remove the splenic enlargement which so frequently follows those disorders. Why two plants so closely allied as the G. robusta and the G. squarrosa, and possessing nearly identical constituents, should give such discordant therapeutical results, is certainly enigmatical. The fact is, that many physicians have a great proneness to run after new remedies, especially when introduced under some pretentious name, and to place a marvellous credulity in the statements of interested parties, who are incapable of determining accurate conclusions as to the value of a remedy. The dose of the fluid extract of Grindelia squarrosa is from fifteen minims to a fluidrachm, repeated every three or four hours. As a local application, the fluid extract is

stated to be of value in the painful eczematous inflammation and vesicular eruption resulting from contact with the poison vine or the poison oak.—K.

GUARANA.

Nat. Ord.—Sapindaceæ. *Sub. Ord.*—Sapindeæ.

The prepared seeds of Paullinia Sorbilis, *Martius.*

Common Names.—Guarana, Uaranazeiro, Uabano.

ILLUSTRATION.—*Bent. and Tri. Med. Plants*, Plate 67.

Description.—The genus Paullinia comprises about eighty species, natives of tropical America, with a single African exception. The *Paullinia sorbilis* is a climbing, shrubby vine, growing in Northern Brazil, in moist, sandy locations. The flexible stem is very long, and takes root readily, wherever it touches the ground, so that a single plant often extends over considerable space. In the wild state the vine attaches itself to large trees, and the fruit is difficult to collect, and of small yield; the vine is cultivated without support. The *leaves* are alternate, stipulate, and consist each of five smooth leaflets; the leaflets have the same shape and dentation as those of Rhus Toxicodendron, and look very much like them. The *flowers* are small, numerous, and disposed in erect, axillary, close panicles; the *sepals* are five; the *petals* are four, and have each a large pubescent scale on the inside, near the base; the *stamens* are eight, attached to a thick column. The *pistil* has a three-lobed ovary, and a sessile, three-parted stigma. The *fruit* is pear-shaped, and generally has a single brownish seed attached to the base, and nearly filling the pericarp.

History.—This plant is of interest to the medical profession from the fact that the drug known as GUARANA is prepared from the seeds, as follows: When half ripe, the seeds are removed from their capsules, dried in the sun, then rubbed between the hands to separate a thin skin (pericarp); they are now powdered coarsely upon a stone, or in a mortar, then moistened with a little water, or exposed to the dew, and kneaded and rolled into cylindrical, oblong, or globular masses, these are exposed to the sun, and dried until they are firm, and are then subjected to the heat and smoke of a slow fire, thus changing the color of their surfaces to a dingy or dark-brown. Sometimes, it is said, the moistened magma of the coarsely-powdered seed is incorporated with cocoa and tapioca before kneading and rolling.

Guarana was introduced into France in the year 1817, by a French officer, and was described in the same year by Gassicourt, in the *Journal de Pharmacie*, the botanical source, however, being then unknown. It was called "*guarana*," after the tribe of South American Indians (Guaranis) who prepared it, and, in 1826, Martius, after identifying the plant, gave it the name *Paullinia sorbilis*, in allusion to the fact that *guarana* is employed to produce a drink.

Guarana appears in our market, generally, in cylindrical sticks, from six to twelve inches in length, and from an inch and a quarter to two inches in diameter, rounding at the ends, and averaging from eight to twenty ounces in weight. It is hard and brittle, externally brown, and often very dark from the action of smoke in curing it. The surface is rough, showing projecting fragments of coarsely-broken seed. It breaks with a somewhat shiny, very irregular fracture, showing, upon either surface, depressions or cavities made by partly protruding fragments of

seed attached to the other surface. Throughout the roll are fissures caused by contraction in drying; internally, it is a reddish-brown conglomerate. There is a peculiar musty odor from the broken surfaces, contaminated with that from the smoke. Its taste is slightly astringent and bitter, leaving a sweetish after-taste resembling that of dulcamara.

Guarana has been analyzed several times; first by Theo. Martius, who discovered caffein (*thein*) in it, and named it *guaranin;* but the fact of its identity with this substance (*caffein*) is due to the researches of Deschastelus, who concluded that it existed in natural combination as *tannate of caffein.* The researches of Jobst, Berthemot, and Steinhause agree that it contains caffein; the latter person (1856) having found five per cent. of this substance in it; and Mr. F. V. Greene (1877) likewise obtained the same amount from it. As the tannic acid of guarana exhibits a somewhat different behavior from other tannins, F. V. Greene proposes to call it *paullinitannic acid.* Guarana also contains some volatile oil, saponin, and other unimportant constituents.—L.

Properties and Uses.—It is very probable that, from the tannin contained in guarana, it has effected recovery from diarrhea, leucorrhea, etc., of a very mild form; but, as we have more prompt and efficacious articles for these affections, in which this agent was at first so loudly heralded, it is no longer employed therapeutically, except for the relief of certain forms of headache. Like coffee and tea, it appears to be a gentle excitant, and is serviceable in cases where the brain becomes irritated or depressed by over mental exertion, and when there is a sensation of fatigue or of exhaustion during very warm seasons; as it has the same chemical composition as caffein, thein, and cocain, we find it has likewise precisely the same physiological action. It is chiefly in nervous headache, in the cephalalgia sometimes accompanying menstruation, and that following a course of dissipation, in which the most benefit is derived from it. Its use appears to be contra-indicated in neuralgia, neuralgic headache, and chronic headache, and in all cases in which it is not desirable to excite the heart, increase arterial tension, or increase the temperature. Its administration is often followed by dysuria. The dose of guarana, in powder, is from ten grains to a drachm, but this is an unpleasant and objectionable form of administration. The fluid extract is probably the most eligible preparation for use; it may be given in doses of from half a teaspoonful to a teaspoonful, in syrup or sweetened water, repeated three times a day. M. Gubler states that *guaranin* possesses diuretic properties; having tested it with several patients; in doses of about seven and a half grains daily, it increased the urine from twenty-seven to sixty-seven and one hundred and seven fluidounces in the course of twenty-four hours.—K.

HYDROCOTYLE.

Nat. Ord.—Umbelliferæ. *Tribe.*—Hydrocotyleæ.

The entire plant of Hydrocotyle Asiatica, *Linn.*

ILLUSTRATION.—*B.* and *T. Med. Plants*, No. 117.

Description.—The genus *Hydrocotyle* is an extensive family, comprising nearly one hundred species that are found throughout the temperate world, consisting mostly of small, inconspicuous marsh herbs. The generic characters are: *flowers* small, in simple umbels; *petals* five, white,

the points not inflexed; *calyx margin* wanting; *fruit* of two carpels which are flattened laterally, five-ribbed, and not furnished with oil-tubes.

HYDROCOTYLE ASIATICA is a low creeping plant, widely diffused over the warmer parts of the world, and abundantly met with in India, Cape of Good Hope, and Australia. The *leaves* are kidney-shaped, crenate, and the petioles attached at the base of the leaf.

In England the genus is represented by a single species, *H. vulgaris*, which is found growing in most parts of Europe. The *leaves* of this species are nearly orbicular, and about the size of an English penny; hence the common name, "penny wort." The name "sheep-rot," is sometimes applied, from the supposition that it causes the "rot" when eaten by sheep. The leaf-stalks are attached to the leaf-blade near the center of the under surface, a position comparatively rare among plants.

There are five American species of Hydrocotyle, all small herbs, growing in swamps. *H. umbellata* and *H. interrupta*, have the leaves peltate; while in *H. Americana*, *H. ranunculoides*, and *H. repanda*, the leaves are attached to the leaf-stalks at the base of the blades. *Hydrocotyle Americana* is the most common native species, and is found farther north than the others. It is a delicate slender plant, growing in damp, shady places; the leaves are thin and smooth, and are borne on short leaf-stalks; the minute white flowers are in close sessile umbels, in the axes of the leaves. The Hydrocotyle vulgaris and the five American species have properties probably similar to those of the H. Asiatica.

History.—In 1852, Dr. Boileau, of India, having been for many years afflicted with leprosy, heard that an American plant called *Chinchunchulli*, was of value. This plant was said to resemble the violet, and while waiting for the arrival of a supply, the Doctor experimented with *Hydrocotyle Asiatica*, and recovered; he subsequently used the remedy with other lepers. His experience was published, the plant being called *bevilacqua*.

In 1853 or 1854, M. Jules Lepine continued the subject in the *Madras Gazette*,[1] and confirmed the assertions of Dr. Boileau regarding its efficacy in leprosy. Before this, however, the plant is said to have occupied a place in the Indian Materia Medica. The composition of the plant is not known, beyond the experiments of Lepine, who decided that an oily substance, named by him *vellarin*, was the active medicinal principal.—L.

Properties and Uses.—This plant should be ranked among the acro-narcotic poisons, along with the Œnantha crocata, and the Cicutas. Boileau, Lepine, and others, have found it useful as a remedy against elephantiasis of the Greeks (leprosy). Devergie, Cazenave, Waring, Hunter, etc., have derived benefit from it in chronic eczema and other cutaneous maladies, in scrofula, secondary syphilis, ulcers, and chronic rheumatism. As the root is very hygrometric, and is not well preserved in powder, its better form for administration is in infusion, or syrup, one ounce of the root to a pint of fluid, and which may be given in doses of from half a fluidounce to a fluidounce, repeated three or four times a day. An alcoholic extract may likewise be used in doses of from one-fourth of a grain to three-fourths of a grain. Notwithstanding the favorable reports concerning the efficacy of this plant, it has fallen into disuse, and is seldom employed at the present day.

The *Hydrocotyle gummifera*, growing in Brazil, and in the Antilles, has been used in hepatic and renal affectons.—K.

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[1] *Pharm. Journ. and Trans.*, 1853 and 1854.

HYDROGEN DIOXIDE.

PEROXIDE OF HYDROGEN. DIOXIDE OF HYDROGEN.

Formula, H_2O_2; molecular weight, 31.94.

Preparation.—Dioxide of hydrogen was discovered in 1818, by M. Thenard, and named *oxygenated water*. He prepared it by acting upon barium dioxide (peroxide of barium), with dilute hydrochloric acid, thus: $BaO_2 + 2HCl = H_2O_2 + BaCl_2$; and afterward separating the barium chloride by the cautious addition of sulphate of silver. At the present time it is made by decomposing hydrated barium dioxide with sulphuric acid, as follows: Freshly prepared hydrated dioxide of barium is gradually added to a *cold* mixture of sulphuric acid and water (not less than five of water to one of acid) until the mixture becomes very slightly acid; the sulphate of barium is then separated by filtration; the excess of sulphuric acid in the filtrate is now removed, by the cautious addition of dilute baryta solution; again filtered; and the aqueous solution of hydrogen dioxide concentrated in vacuo over sulphuric acid: $BaO_2 8H_2O + H_2SO_4 = BaSO_4 + H_2O_2 + 8H_2O$.

History.—Dioxide of hydrogen is produced when peroxide of potassium, sodium, barium, strontium, or calcium, is digested in any acid which forms a soluble salt with the base (*Watts*). Clermont reported finding it in the juices of a great variety of plants, but the experiments of Bellucci failed to support him. Struve states that the combustion of hydrogen in the atmosphere produces hydrogen dioxide, together with ozone and ammonium nitrite. Struve and others report that it is often present in the atmosphere, in rain-water, and in snow; Houzeau failed in his first attempt to find it in rain-water, but afterward discovered it in snow, at Rouen (*Compt. Rend.* lxx, 519.)

Hydrogen Dioxide, is a colorless, odorless, oily appearing liquid, of specific gravity 1.452, and does not solidify at —30° C. (—22° F.) (*Thenard*); it evaporates in vacuo at ordinary temperatures, without decomposition, and does not redden, but bleaches, litmus and turmeric paper; it has an astringent, bitter taste; when applied to the skin it first bleaches, and subsequently develops a white blister, accompanied with violent itching, followed by painful irritation. It mixes in all proportions with cold water, and when a solution, containing eight times its volume of oxygen, is heated to 50° C. (122° F.), the oxygen begins to be evolved, ebullition increases, and upon ceasing, water only remains. Concentrated hydrogen dioxide evolves oxygen slowly at 20° C. (68° F.), but if quickly heated to 100° C. (212° F.), the separation is violent, and sometimes explosive (*R.* and *S.*). It is also decomposed with almost explosive violence when in contact with finely-divided metals, as gold, silver, and platinum, the metals remaining unaltered. The oxides of these metals are decomposed by, and in turn decompose, hydrogen dioxide; the metals being reduced to a metallic state, and free oxygen liberated; thus we have a powerful oxidizing agent which acts as a reducer; for hydrogen dioxide transforms many basic oxides into peroxides. With solution of ferrocyanide of potassium it forms ferricyanide of potassium; with solution of ferrous sulphate it forms ferric sulphate, etc. An aqueous solution of hydrogen dioxide, is used to clean and bleach old engravings and oil paintings, and, according to Cameron, the popular colorless solution employed to change dark hair to yellow is this substance.

TESTS.—When a solution of ferrous sulphate is mixed with phenol,

the addition of a small amount of hydrogen dioxide, gives a green color; of a large amount, a dark green precipitate. According to Parnell, the test will fail if the phenol be added *after* the admixture with hydrogen dioxide. When a solution containing dioxide of hydrogen is acidulated with sulphuric acid, and then mixed with a little ether, the addition of a few drops of solution of potassium chromate, will develop a blue color (perchromic acid), and, upon agitation, the ether will dissolve it and separate in a blue layer. Hydrogen dioxide liberates iodine from a solution of iodide of potassium and ferrous sulphate (*Schonbein*), a reaction so delicate, as to form the blue iodide of starch, when but one part of hydrogen dioxide is present in twenty-five million parts of solution.—L.

Properties and Uses.—This agent was introduced to the profession as a therapeutical means, by Dr. B. W. Richardson, of London, England (1860). From experiments instituted by him, he found that certain animal substances when brought into contact with a solution of peroxide of hydrogen, liberated its oxygen, as was the case with fibrin, carbonic acid, etc. The presence of free oxygen in the system must act as a stimulant, oxygenate the blood, and antagonize septic conditions; he, therefore, recommended its employment, therapeutically, in all cases marked by deficient oxidation; as an antidote to various poisons; in low fevers, and in all cases manifesting deficient oxidation; in diabetes, tetanus, and cancer. Subsequently, from a larger experience, he advised it as useful in chronic rheumatism, in scrofulous tumors and abscesses, in pertussis to mitigate the paroxysms, in the dyspnea attending chronic bronchitis, and in poisoning by narcotics. He recommended that the solution employed should be charged with ten volumes of oxygen, which could be readily determined by an estimate of the amount of oxygen present in the peroxide of barium employed in its manufacture; and of this preparation the dose varies from one to four fluidrachms, largely diluted with water, to be repeated three or four times daily. As a topical stimulant and disinfectant, it has been found useful in scrofulous, syphilitic, and other ulcers. Both the aqueous solution and the ethereal solution (*ozonic ether*) have been employed internally, and the various experimenters with this agent, since its introduction, differ greatly in their views as to any therapeutical efficacy it may possess. At the present time it is rarely used except as a test for blood stains.—K.

LABURNUM.

Nat. Ord.—Leguminosæ. *Sub Ord.*—Papilionaceæ. *Tribe.*—Genisteæ.

The seeds of Cytisus Laburnum, *Linn.*

Common Names.—Bean-trefoil, Golden chain.

ILLUSTRATION.—*Bot. Mag.*, Plate 176.

Description.—Laburnum is an unarmed shrub or small tree, native of the mountainous portions of Southern Europe, and frequently found in cultivation, especially in Great Britain. The *leaves* are petiolate and trifoliate, with ovate lanceolate leaflets, pubescent underneath. The golden-yellow *flowers*, which appear from May to June, are very showy, and are disposed in loose, pendulous racemes. The *calyx* is campanulate and two-lipped; the upper lip is entire, the lower one three-toothed. The *corolla* is papilionaceous, with a large vexillum. The *fruit* is a brown legume, containing many seeds, and is attenuate at the base.

History.—The genus Cytisus is almost exclusively European, and there is no indigenous species in the United States. Cytisus Scoparius (*Link*), or "common broom," a very abundant shrub in Great Britain, is extensively used as a diuretic.

The ripe seeds of Laburnum yield an alkaloid, *cytisin*, which is crystallizable, colorless, and deliquescent. It is strongly alkaline, and neutralizes acids. Its taste is nauseously bitter, and it is soluble in water and dilute alcohol, but not in ether; a few grains of it taken internally occasion very serious symptoms. The unripe seeds likewise yield an alkaloid, *laburnin*, which does not combine with acids, is soluble in water, and less soluble in alcohol or ether. The seeds, as well as other parts of the tree, have been examined at several times, but the results have not been very satisfactory. Thus, Chevallier and Lassaigne, having first determined a bitter, amorphous principle, subsequently discovered in the ripe seeds *cytisin* or *citysin*. Dr. T. S. Gray subsequently obtained from the seeds and the bark three vegetable principles, one an acid, *laburnic acid*, and the other two, bitter, neutral substances, *cystin* and *laburnin*, each of them being soluble in water. While Husemann and Marmé discovered two alkaloids in the root, both said to be poisonous; one, *cytisin*, they also procured from the ripe seeds, and the other, *laburnin*, from the unripe seeds. They are both crystallizable, and while cytisin neutralizes the strongest acids, laburnin had only been combined with the chlorides of gold and of platinum. Wittstein recognizes only these two just described.[1]—L.

Properties and Uses.—Administered to certain animals, as the dog, cat, etc., even in small doses, M. Chevallier found it to occasion emesis, muscular debility, increased pulse, accelerated respiration, somnolence, spasms, and finally death. With man, according to Dr. T. S. Gray, Popham, Clout, and others, the bark, the flowers, or the seeds, in large doses, produce a sense of indisposition, drowsiness, followed by vomiting, vertigo, cold sweats, dryness and constriction of the throat, gastric pain, pallor, purging, accelerated respiration, strong contraction of the features, dilatation of the pupils, muscular contractions, quick and agitated pulse, and other symptoms of narcotism. Recovery from these symptoms occurs more or less speedily, and no case is recorded in which death was the result. In cases of poisoning by laburnum, Dr. Gray has advised the use of charcoal, though, in many severe cases, persons who have suffered severely from the symptoms named, have promptly recovered without the aid of any antidote. Chevallier, who, having taken six or eight grains of cytisin, found himself threatened with severe symptoms, drank quite freely of lemonade, and thereby checked their further progress. In medicinal doses, Dr. Gray recommends the use of the active principles of laburnum in the treatment of dyspepsia attended with vomitings of bile-matters and alternate attacks of diarrhea and constipation, likewise to check the vomiting of children who eject their food soon after its ingestion; to relieve bronchial cough, and mitigate the severity of the paroxysms of pertussis, and asthma, and to prevent the sympathetic vomitings of pregnancy; however, these recommendations have not been supported by subsequent trials. The dose of a decoction, of sp. gr. 1.034, is from two to thirty minims; of cytisin, from one eighth of a grain to two grains; of laburnin, from two to ten grains. In case of poisoning, the the better course to pur-

[1] *Organic Constituents of Plants.*

sue is to remove the contents of the stomach as speedily as possible by warm water, and then to administer diffusible stimulants.—K.

LITHII.

LITHIUM.

Symbol.—Li; atomic weight, 7.01.

Lithium is the metallic basis of an alkaline oxide, lithia, and has not yet been employed in medicine nor in the arts. The name, meaning "stony," is derived from the Greek *lithos*, a stone. The alkali was discovered by Arfwedson, in 1817; the element, by Bunsen and Matthiessen, in 1855. Lithium is very widely distributed, but in small quantities. The important minerals which contain it are, triphyline (a phosphate of iron, manganese, and lithium), petalite (a silicate of aluminum, sodium and lithium), and spodumene, or triphane. Some mineral springs are likewise found to contain it in considerable amount, notably one in the Wheal Clifford mine, in Cornwall, England. Our Gettysburgh Springs, Penn., and the Buffalo Lithia Springs, Mecklenburg Co., Va., likewise contain it; and to it they undoubtedly owe their efficacy, in gout, rheumatism, and uric acid diathesis. For the process of extraction, *see* any chemical technology. Lithium is much less oxidable, and harder than either potassium or sodium, but is softer than lead. When freshly cut it exhibits a silver-like surface, which tarnishes by exposure. It melts at 180° C. (356° F.), is the lightest of all known solids, having a sp. gr. of 0.5986, floats on benzine and on water, quickly oxidizing in the latter case, but without fusing. Lithium is of interest to the medical profession from the fact that four compounds of it are employed in medicine; they are the carbonate, benzoate, bromide, and citrate; the first being employed in the production of the others.—L.

LITHII BENZOAS.

BENZOATE OF LITHIUM.

Formula, $LiC_7H_5O_2$; molecular weight, 127.72.

Preparation.—This is a permanent white powder, very soluble in water, and soluble in about ten parts of alcohol. To prepare it, add carbonate of lithium to benzoic acid mixed with hot water, until effervescence ceases and the acid is dissolved and saturated; then filter, and evaporate the filtrate to dryness upon a water-bath, thus: $Li_2CO_3 + 2HC_7H_5O_2 = 2LiC_7H_5O_2 + H_2O + CO_2$. The salt may be obtained in permanent crystals, by evaporating the solution and setting the capsule or vessel aside. The crystals are in the form of glistening, pearly scales. In our own experience, thirty-two parts of benzoic acid mixed with one hundred and twenty-eight parts of water, require eleven parts of carbonate of lithium; and the yield is, practically, about that of the weight of the acid employed. The impurities to be expected are such as accompany carbonate of lithium.—L.

Properties and Uses.—The employment of lithium compounds in medicine is due to the fact that the urate of lithium is much more soluble than the other alkaline urates. Benzoate of lithium was recommended by E. B. Shuttleworth, as an agent, superior to other compounds of

lithia in the treatment of gout, and certain disorders of the urinary organs, more especially when there is an excess of urates, or of uric acid. It is a stable, non-deliquescent preparation, and consists of a combination of two agents, each of which have been found valuable in the treatment of certain forms of urinary difficulties, as well as in chronic inflammation of the neck of the bladder. It acts as a diuretic, and is especially useful to prevent gouty paroxysms, by preventing the formation and subsequent deposition of insoluble urates in the tissues, to remove the tendency to excessive deposition of uric acid or urates in the urine, and to render this fluid neutral or alkaline. The dose is from three to ten grains, dissolved in a tablespoonful of water, repeating the dose three or four times daily.—K.

LITHII BROMIDUM.

BROMIDE OF LITHIUM.

Formula, LiBr; molecular weight, 86.76.

Preparation.—This salt may readily be prepared, as follows: To a given amount of solution of hydrobromic acid, in a glass or porcelain evaporating-basin, add gradually, with constant stirring, carbonate of lithium until the acid is saturated and effervescence ceases; then filter, and evaporate the filtrate to dryness. The reaction is represented as follows: $2HBr + Li_2CO_3 = 2LiBr + H_2O + CO_2$.

History.—Bromide of lithium is very deliquescent, and is soluble both in alcohol and water. Owing to the low combining power of lithium, its bromide contains about ninety-two per cent. of bromine, while the potassium bromide contains nearly sixty-six per cent., and the sodium bromide about seventy-eight per cent. Its taste is not so disagreeable as that that of the potassium salt, but more so than that of the sodium, or ammonium bromides. It is *incompatible* with solutions of the carbonates of the other alkali metals, forming, by decomposition, carbonate of Lithium (Li_2CO_3).—L.

Properties and Uses.—M. Roubaud, having investigated the action of this compound, has arrived at the following conclusions: That it possesses the lithontriptic properties common to the lithia preparations; that, like other bromides, it affects reflex sensibility, with energy, and without that inconvenient action upon the heart usually following the use of bromide of potassium; and that it is useful as a sedative and antilithic, in cases of uric acid diathesis accompanied by painful phenomena, or complicating neuroses. E. Levy considers it to have a beneficial effect in gout, but less so than some of the other salts of lithium, although its influence in diminishing the quantity of uric acid is very small; being very rich in bromine, it is more active than bromide of potassium, having a marked sedative influence upon the cerebro-spinal axis, without affecting the heart. Dr. S. W. Mitchell has found it to be a rapid and powerful soporific agent, more so than any of the other bromides used in therapeutics, and has employed it advantageously in the milder forms of epilepsy, in headache, insomnia, wakefulness from mental or physical exertion, and in tinnitus aurium, attended with pain in the temporal region and sleeplessness. It has likewise been found beneficial in certain cases of spermatorrhea, chronic irritability of the neck of the bladder, and in irritable uterus. The dose is from three to ten grains, in solution, which should be repeated three or four

times a day. Owing to its extreme deliquescence, this salt should be kept in aqueous or alcoholic solution.—K.

LITHII CARBONAS.

NORMAL CARBONATE OF LITHIUM.

Formula, Li_2CO_3; molecular weight, 73.87.

History.—This salt is never prepared by the pharmacist. It is made by pouring a concentrated solution of chloride of lithium (LiCl) into a solution of ammonium carbonate, in ammonia water, continuing the process until the precipitate ceases to form upon heating. It fuses at a high temperature, and colors an alcohol flame crimson when held within it upon a platinum foil or wire, that has previously been moistened with muriatic acid. It is but slightly soluble in water, one hundred parts of water, at 13° C. (55°.4 F.), dissolving but 0.769 parts of the carbonate (*Kremers*). In this respect it differs from the carbonates of the other alkali metals (potassium and sodium being the common examples), approaching the carbonates of the next group. It is dissolved, with effervescence, by diluted acids, forming the respective salts, and which are mostly very soluble. When dissolved in hydrochloric acid, the resultant chloride is very soluble in alcohol, and likewise in mixtures of alcohol and ether, in equal proportions (*Hoffmann*). This test serves to distinguish it from the more probable impurities, carbonates of potassium and of sodium, the chlorides of which elements are not soluble, especially in the latter of the menstruums named. Sometimes carbonate of lithium is fraudulently adulterated with sugar of milk; this may be detected by its reduction of the copper salt in Fehling's test-liquor; also, by the adulteration emitting a caramel odor, and turning black when exposed to a heat for calcination.

HYDROGEN LITHIUM CARBONATE, or the acid lithium carbonate ($HLiCO_3$), is formed when freshly precipitated normal carbonate of lithium is suspended in water and exposed to a current of carbon dioxide. This salt is more soluble than the common carbonate, about five parts dissolving in one hundred parts of water. It readily decomposes by exposure, forming normal carbonate of lithium, carbon dioxide, and water, thus: $2HLiCO_3 = Li_2CO_3 + H_2O + CO_2$. The acid salt is never found upon the market, and is not used in medicine; although it is, very probably, the form in which it exists in certain mineral waters.—L.

Properties and Uses.—Carbonate of lithium is considered a diuretic, and an energetic alkalizing agent of the urine. Administered internally, it causes the insoluble urates of the blood to form soluble urates of lithium, and hence has been advised in gout, and in urinary deposits of uric acid and urates, the same as the benzoate and the citrate of this alkali. The action of these agents may fail under certain conditions of the system, which, after having been ascertained, should be removed by appropriate measures previous to the administration of the lithium salts. The dose of carbonate of lithium is from one to four grains, in a gill or so of hot water, repeating it three or four times a day. Garrod and Charcot advise it to be taken as follows: Water, charged with carbonic acid, one pint, bicarbonate of soda three grains, carbonate of lithium a grain and a half; mix, and keep well stoppered. This quantity is to be used daily, in wineglassful doses, continuing to prepare and use it for two or three consecutive weeks.—K.

LITHII CITRAS.

CITRATE OF LITHIUM.

Formula, $Li_3C_6H_5O_7$; molecular weight, 209.57.

Preparation.—Take of carbonate of lithium one part; citric acid, in crystals, two parts, or a sufficient quantity; distilled water, a sufficient quantity. Mix the carbonate of lithium with two parts of water heated to the temperature of 180° F. (82°.22 C.), in a capacious glass or porcelain vessel. Then dissolve the citric acid in four parts of water, at the same temperature, and gradually pour a sufficient amount of the acid solution, with constant stirring, into the mixture of carbonate of lithium and water, to dissolve the carbonate. Then raise the temperature to 200° F., and cautiously stir into the solution a few grains of carbonate of lithium; if effervescence ensues, continue adding more of the carbonate until it is in *slight* excess; now filter the solution, evaporate, at a gentle heat, to the consistence of syrup; then dry in a warm-air closet, until the salt will pulverize, and inclose it in a well-stoppered bottle.

History.—As usually made, citrate of lithium is a very unsatisfactory preparation, from its proneness to deliquesce. To a great extent, this property is derived from the *excess* of citric acid usually present. We will call attention to the fact that, by reversing the process of the *U. S. Pharmacopœia* and adding the solution of citric acid (q. s.) to the carbonate of lithium, better results appear to be obtained by us than with the process of the *Pharmacopœia*. Citrate of lithium, as prepared according to our process, may contain a *slight* proportion of carbonate of lithium, an unimportant contamination. It is liable to contain all the impurities present in both the citric acid and the carbonate of lithium employed in its preparation. It is a very white powder, permanent in a dry atmosphere, and becoming moist when exposed to damp air. It is very soluble in water.—L.

Properties and Uses.—Citrate of lithium is employed in the same affections as the carbonate, and in the same doses; being the more soluble of the two, it has been preferred. Its dose is the same as that of the carbonate, and like this it may be carried to, from fifteen grains to even half a drachm; but, these large doses are apt to occasion cardialgic dyspepsia. The iodide, salicylate, and sulphate of lithium, have occasionally been employed therapeutically, but no especial advantage has yet been derived from their use.—K.

LITHOSPERMUM OFFICINALE.

Nat. Ord.—Borraginaceæ. *Tribe.*—Borrageæ.

The roots and seeds of Lithospermum officinales, *Linn.*

Common Name.—Common Gromwell.

ILLUSTRATION.—*Woodville's Med. Bot.*, Plate 105.

Description.—This is a large, rough, hairy weed, a native of Europe, and very common in some parts; it is rarely naturalized in the eastern section of the United States, and is found growing in dry and gravelly soils. The *stem* is from one to two feet high, erect, much-branched, and covered with small, stiff hairs. The *leaves* are numerous, veiny, al-

ternate, sessile, ovate, and acute at the apex. They are covered with a close, grayish pubescence, which is rough and stiff on the upper surface, but softer beneath. The *flowers* appear in June, and are small, in axillary or terminal, revolute, leafy spikes. The *calyx* has five acute lobes. The *corolla* is salver-form, slightly exceeds the calyx, and is of a pale-yellow color. The *fruit* consists generally of one or two smooth, hard, shiny, gray, ovate nutlets, which are attached to the persistent calyx by the base. A native species of Lithospermum, L. latifolium (*Mich'x*) closely resembling the L. officinale, especially in the smooth, polished nutlets, and considered a variety of it by Willd., is common in open woods of the Middle States. It has green leaves, and is more loosely branched than the introduced species. Neither of the plants have been analyzed, according to authority at our command.—L.

Properties and Uses.—This plant is diuretic, possessing properties analogous to those of the Onosmodium Virginianum, and deserves further investigation. It has proved efficacious in both acute and chronic cystitis, and likewise in certain calculous affections. A strong infusion of the dried root, one ounce to water one pint, may be given every three hours in tablespoonful doses. The seeds, in powder, are used in half-teaspoonful doses, every four or five hours.—K.

MANGIFERA INDICA.

Nat. Ord.—Anacardiaceæ. *Tribe.*—Anacardieæ.

The inner bark of the root and tree of Mangifera Indica, *Linn.*

Common Name.—Mango.

ILLUSTRATION.—*Bot. Mag.*, Plate 4,510.

Description.—This is a tall tree, native of the East Indies, but cultivated in most parts of the tropics, on account of its edible fruit. The *leaves* are alternate, lanceolate, entire, from six to eight inches long, and one-quarter as wide. They are petioled, and borne in clusters near the end of the branches. The *flowers* are small, yellowish, and disposed in large, loose, terminal panicles. The calyx-lobes and petals are five. The *stamens* are five, alternate with the petals, and all but one abortive. The *fruit* is a reddish-yellow drupe, about the size of a quince, and kidney-shaped; it consists of a hard, fibrous nut which is surrounded by edible flesh in a manner like the peach, and is known as "mango fruit." It is largely consumed in tropical countries, and forms one of the most highly esteemed fruits. The natives of India use the leaves and leaf-stalks to harden the gums; the wood, together with sandal wood, is used by the Hindoos for burning their dead, and an infusion of the bark is employed for various skin diseases. When incisions are made into the bark of the tree, a soft, reddish-brown gum-resin exudes, which hardens by age, and resembles *bdellium*; this dissolves in spirits and partly in water, forming milky solutions; when chewed it softens, adheres to the teeth, and gives a pungent and slightly bitter taste (*Roxb*).

History.—In 1877, Dr. M. F. Linquist, New Haven, Conn., introduced the bark to the medical profession, having found it beneficial in a number of diseases. The bark was imported under the name "*mango*," for the purpose of removing incrustations from steam boilers, it having been stated that when a small amount of a strong solution of the bark

is added to the water within the boiler, the saline deposit quickly separates. The bark is very astringent, and this property suggested to Dr. Linquist, its appropriate application in a therapeutical sense. As found in market it is a coarse powder, of a deep brownish-red color, none of the bark, entire, having come under our observation. The odor is peculiar, being, in a very slight degree, terebintheous. The taste resembles that of rhatany.—L.

Properties and Uses.—Mango bark has been recommended in the treatment of nasal catarrh, diarrhea, dysentery, vaginitis, metritis, diphtheria, hemorrhages, etc. Dr. Linquist, in writing to me concerning its use, makes the following statement: "I have used it for upward of eight years, and have largely experimented with it. It is an astringent of peculiar power upon the mucous membrane. I first employed it in certain uterine diseases, with marked benefit. In catarrh, with the spray-atomizer, I have used it with better success than any other agent. In diphtheria, and other malignant diseases of the throat, its effect has been truly marvellous. During last year I have had several cases of diphtheria, that I have treated exclusively with the fluid extract, penciling the fauces with it, of full strength, and also using it as a gargle in the proportion of two fluidrachms of the fluid extract to four fluidounces of water. As an internal remedy in hemorrhages from the uterus, bowels, or lungs, or in muco-purulent discharges from either the bowels or uterus, I know of no agent equal to it. It appears to have the following advantages: The dose is small, is easily taken, has no disagreeable taste, does not derange the stomach, is rapid in its action, and more certain in its effects than other medicines."

Professor A. J. Howe, M. D., writes me as follows: "During the past year I have prescribed a tincture of Mangifera Indica on many occasions; and I find it most useful in lessening leucorrheal discharges, and in diminishing too profuse menstrual evacuations. The agent exerts an astringent action, but not to the extent of constipating the bowels. It assuages catamenial pains to an appreciable degree, and corrects menstrual disorders in general. I consider the medicine as a valuable adjutant to gynæcological therapeutics. I have also prescribed it in the treatment of chronic diarrhea, and in obstinate gleet, and have obtained quite satisfactory results, though not better than from the use of the extract of logwood, or Pinus Canadensis. In a case of albuminaria, the remedy, for a week or two, greatly lessened the amount of albumen discharged; yet it made no decided change for the better."

The dose of the fluid extract is from fifteen minims to a fluidrachm. Dr. Linquist adds from two to four fluidrachms of the fluid extract to four fluidounces of water, and this mixture he administers in teaspoonful doses, repeated every hour or two.—K.

METHENE DICHLORIDE.

BICHLORIDE OF METHYLENE.

(*Syn.—Methylene Dichloride; Monochlorinated Chloride of Methyl; Chlorinated Chloride of Methyl; Dichloromethane*)

Formula, CH_2Cl_2; molecular weight, 84.71.

History.—This substance may be considered the second substitution product of the action of chlorine upon methane (*marsh gas*), CH_4, the

first product being methyl chloride, or chloromethane, CH_3Cl; or it may be considered, as we prefer, a dichloride of methylene (*methene*), CH_2; or we may call it a derivative of methyl, CH_3. It was discovered in 1840, by Regnault; Dumas and Peligot having prepared chloride of methyl about five years previously. It is difficult to prepare, and is seldom found in commerce. It is formed when chlorine gas is passed into di-iodomethane covered with water, the retort containing it being at the same time heated; iodine separates in crystals, and an oily liquid (*dichloromethane*), with impurities, passes into the cooled receiver. This is purified by prolonged contact with chlorine, then distilling from solution of potash, and afterward agitating with calcium chloride, and redistilling to separate water. It may also be made (Regnault's process), by chlorination of methyl chloride (CH_3Cl), bringing the gases together in the sunlight, and afterward separating the methene dichloride by fractional condensation; also by the action of chlorine on methyl iodide thus: $CH_3I + Cl_2 = CH_2Cl_2 + HI$. It was formerly supposed that two isomeric compounds existed of the composition CH_2Cl_2, but the idea is now generally abandoned, although some hold that the preparation made by Regnault's process is, properly, *chlorinated methyl chloride*, CH_2Cl,Cl. And it has been likewise stated that the products of the two processes differ in regard to their boiling points and specific gravities.

Dichloride of *Methene* is a colorless liquid, of a sweet chloroform-like odor, of specific gravity 1.360 at 0° C. (32° F.); boiling at 40° C. (104° F.) (*Buttlerow*), 40° C. to 42° C. (104° F. to 107°.6 F.) (*Perkins*). According to Watts and others, Regnault's boils at 30°.5 C. (86°.+ F.). has a specific gravity of 1.344 at 18° C. (64°.4 F.), is very volatile, and resembles Dutch Liquid. It is dissolved by alcohol or ether, does not affect test-papers, and emits a vapor that is readily combustible.

It is stated that chloroform has been substituted for methene dichloride, but the fraud can be readily detected by the specific gravity, unless the adulterating liquid be reduced to the gravity of methene by addition of ether. In this case, the odor of ether will be apparent. Should a mixture of chloroform and absolute alcohol be prepared and substituted. agitation with cold distilled water will separate the alcohol, and the difference in bulk will reveal the fraud, while the specific gravity of the heavy liquid will be found greater than 1.360.—L.

Properties and Uses.—Bichloride of methylene has been proposed by Richardson, Wells, and others, as an anesthetic. The inhalation of its vapor is rather agreeable, its influence occurs without any unpleasant sensations, and the return to consciousness is rapid and without any feeling of prostration. Vomiting frequently accompanies its administration, and, occasionally, a very obstinate period of agitation and struggling. It has been considered less dangerous than chloroform, though Richardson states that it is one of a dangerous family of chemical substances, involving more or less risk, unless used with great care. Spencer Wells, the celebrated ovariotomist, having employed it in nearly one thousand cases, in the course of a surgical practice of ten years, recommends it as more effective and less dangerous than any other known anesthetic; yet, notwithstanding these commendations, and their confirmation by several other surgeons, the substance has not come into general use in surgical practice. The quantity required for inhalation varies from twenty to forty minims; and ten or twenty minims subsequently, if required, whenever symptoms of a return to consciousness begin to manifest themselves. The use of this vapor, undiluted,

is unsafe; it should always be inhaled in association with a certain quantity of atmospheric air; and for this purpose, a hollow cone, of metal or pasteboard, perforated with numerous apertures, has been advised. The material upon which the liquid has been poured, is to be placed within the cone, and the vapor be inhaled therefrom. Wells recommends Junker's apparatus for this purpose.—K.

MIMULUS PILOSUS.

Nat. Ord.—Scrophulariaceæ. *Tribe.*—Gratioleæ.

The plant Mimulus pilosus, *Watson.*

Common Name.—Hairy Monkey-flower.

Description.—This is a small annual plant, a native of California, and found growing in damp situations. It has an erect, angular *stem*, less than a foot high, and much branched from near the base. The entire plant is covered with soft and sticky hairs, whence the specific name. The *leaves* are opposite, from one to two inches long, sessile, and entire. The *flowers* are small, bright-yellow, and are borne on short axillary peduncles; they appear in July and August. The *corolla* is about one-fourth an inch in length, and two-lipped; it has a broad tube, a two-lobed, erect upper lip, and a three-lobed lower lip, bearing two purple spots. The *calyx* is bell-shaped, slightly shorter than the corolla-tube, and has five unequal teeth. The *fruit* is a dry two-celled capsule, containing many seeds. This plant has never been examined chemically.—L.

Properties and Uses.—This plant is of recent introduction to the profession, and deserves further investigation. A local application of the plant, in the form of a cataplasm, made either by bruising the leaves, or by steeping them in hot water, is very efficacious in local inflammations, and painful affections, as in rheumatism, neuralgia, erysipelas, burns, etc. A tincture of the plant will likewise be found beneficial in rheumatism, neuralgia, and other painful disorders, in the dose of from three to ten minims, repeated three or four times a day. In cardiac affections, the sequence of rheumatic attacks, it has proved very serviceable in several cases. In obstinate bronchial and laryngeal affections, I have derived much benefit from the use of a tincture, made with diluted alcohol, in the form of spray. It is probable that some of the other species of Mimulus possess similar properties.—K.

MONESIA.

Nat Ord.—Sapotaceæ.

Extract of the bark of Chrysophyllum Glyciphlœum, *Casaretti.* (*Syn.*—C. Buranhem, *Riedel.*)

Common Name.—Monesia.

Description.—Chrysophyllum Glyciphlœum is a common Brazilian tree, known locally as *Buranhem* or *Guaranhem.* It is often from forty to fifty feet in height. The genus *Chrysophyllum* comprises several species, mostly South American trees, with milky juice. The *leaves* are alternate, entire, and furnished with a golden-yellow pubescence

underneath, hence the name. The *flowers* are small, and in fascicled umbels in the axils of the leaves. The *corolla* is bell-shape, and has five stamens. The *ovary* has ten one-ovuled cells, and bears a peltate ten-lobed stigma. The *fruit* of *C. cainito*, and other species, are called "star apples," and are eaten by the natives. Chrysophyllum Glyciphlœum is of interest from the fact that an extract of the bark is used in medicine, and known as *monesia*.

History.—The bark is in fragments, nearly smooth, and cinnamon-colored internally. The pieces are thin, about one-fourth or half an inch in thickness; at first, a sweetish taste is imparted, which subsequently becomes acrid and astringent. It has no odor. Shortly after the introduction of monesia bark, Derosne and Henry examined it, and found it to contain chlorophylle, vegetable wax, *glycyrrhizin*, tannin, and red coloring matter. The supposed active principle is acrid, and has been named *monesin;* although it is probable that the tannin and other substances are of therapeutic value.

MONESIA, the extract of the foregoing bark, was introduced to notice in 1839, in an article written by Dr. St. Ange, and published in the *Paris Medical Gazette.*[1] The extract appeared in the form of brown, brittle cakes, of about one pound each, insoluble in ether, partly soluble in alcohol, but more so in water; forming, with the latter menstruum, a frothy soap-sud like solution. (*Monesin* is perhaps identical with saponin, hence the froth.) Monesia extract is said to be found, at the present time, in Brazil, much more pure than formerly, and in the shape of yellowish-white plates.—L.

Properties and Uses.—Monesia appears to possess slightly stimulating and astringent properties. In doses of from two to ten grains, repeated two or three times a day, it acts as a gentle excitant of the stomach, improving the appetite and the digestive functions. In larger doses, it causes a burning sensation in the epigastric region, gastric uneasiness, and costiveness. It has been found advantageous in certain atonic forms of dyspepsia, as a stimulant and tonic; likewise as a tonic and astringent, in diarrhea, and hemorrhages, as from the lungs, stomach, and kidneys, in hemorrhoids, and in profuse menstruation. In chronic bronchitis, attended with considerable expectoration, and in the catarrhal affections and winter cough of persons in advanced years, it has proved useful. As an alterative, it has been advised in scrofulous and scorbutic affections, though it is somewhat doubtful as to its good effects in these cases, although it is stated to have been effectual in the purpura of scurvy. As a local application, in the form of powder sprinkled upon the parts, in aqueous solution, tincture, or ointment, it has proven valuable in obstinate, indolent ulcers, in anal and buccal fissure, in scorbutic or other unhealthy condition of the gums, in vaginal leucorrhea, and in nasal hemorrhage; it may be applied on lint, as a wash, by injection, or by spray.

The dose of monesia is from two to ten or fifteen grains; of monesin, from one-fourth to one-half of a grain. These may be given in pill or powder, and in some syrup or other convenient vehicle. The tincture may be made of any desirable strength, from one to four ounces of monesia extract to a pint of alcohol. The ointment may be made by triturating one drachm of the extract with seven drachms of cerate, or purified lard.—K.

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[1] *British Pharm. Journ.*, Vols. iii and iv.

NARCISSUS.

Nat. Ord.—Amaryllidaceæ.

The bulb of Narcissus pseudo-narcissus, *Linn.*

Common Name.—Daffodil.

Description.—This is a perennial bulbous plant, native of the central and northern parts of Europe, and a common plant in moist woods in England. It is often cultivated in this country, especially the form with double flowers, and is among the first of spring flowers. The *bulb* is globular, white internally, and has a blackish coat. The *leaves* are all radical, linear, and about a foot long. The *scape*, which is a little longer than the leaves, is erect, and bears a large, terminal, nearly nodding flower of a yellow color. The *flower* is inclosed in bud in a membranous spathe, which splits lengthwise when the flower expands, and remains persistent at its base. The perianth has a funnel-form tube and six acute segments, about an inch long; near the mouth of the tube is borne a large bell-shape cup, about the length of the perianth segments, and with a crisped, six-lobed margin. The *stamens* are six, attached to the perianth tube, and included in the flower. The *pistil* consists of a three-celled, inferior ovary, a slender style, and a three-lobed stigma. The *seeds* are numerous.

NARCISSUS POETICUS (*Linn.*) is an allied species, native, of Central Europe, and naturalized in many places in England; it is one of the most common of spring flowers in cultivation in this country. The ovate bulb has a brown skin, and possesses medical properties similar to the bulbs of N. pseudo-narcissus. The perianth-segments are spreading, and of a pure white color. The cup is very short, and has a crenate, crimson margin. There have been no satisfactory chemical examinations made of these plants, though M. Jourdan has described a white, deliquescent active principle, possessing emetic properties, which he named "narcitine;" and M. Caventou obtained from the flowers an odorous, yellow coloring matter which he termed "narcissine."—L.

Properties and Uses.—The flowers and bulbs of this plant are the parts that have been employed, and the recent, wild plant, appears to possess more active properties than the cultivated. Internally, in large doses, it is an active and even dangerous article, occasioning severe emeto-catharsis and gastro-intestinal inflammation; and its local application to the surface of ulcers and wounds is stated to occasion similar results, and, in addition thereto, serious depressing effects upon the nerve centers. As a medicine, it is rarely employed in this country, but is said to possess emetic, cathartic, antispasmodic, and narcotic properties. It has been used in epilepsy, in hysteria, and other spasmodic affections. Laennec employed it with success in pertussis, and other European practitioners have accorded to it an efficacious action in intermittent fever, diarrhea, dysentery, worms, etc.; it has likewise been found of prompt benefit in severe catarrh. The dried flowers or bulbs, in powder, have been administered in doses of from ten to sixty grains, and of the bulbs even to two drachms; the aqueous extract provokes vomiting in the dose of from one to three grains. A syrup, an ethereal oil, and an acetous tincture have also been employed.—K.

NITROBENZENE.

NITROBENZOL.

Formula, $C_6H_5NO_2$; molecular weight, 122.75.

Preparation.—This article is prepared (impure), in quantities for the purpose of manufacturing aniline colors, by acting upon benzene with a mixture of nitric and sulphuric acids; or, by decomposing nitrate of sodium in contact with benzene, by means of sulphuric acid (*Perkins*). In the former case, the sulphuric acid seems to concentrate the nitric acid, by abstracting water from it; and, in the latter case, it liberates nitric acid from its combination with sodium. It was discovered by Mitscherlich, and was originally made by slowly adding benzene to warm, fuming nitric acid. An oily liquid separates on cooling, which is washed with water, and then distilled from chloride of calcium.

History.—NITROBENZENE is a yellowish, oily liquid, having the odor of bitter almond oil, and a sweet taste. Its specific gravity is 1.1866 at 14°.4 C. (59° F.) (*Kopp*); 1.20 at 0° C. (32° F.). It boils at 213° C. (415°.4 F.) (*Mitscherlich*); 219° to 220° C. (426°.2 F. to 428° F.) (*Kopp*); is insoluble in water, but dissolves in all proportions in ether and alcohol. It forms acicular crystals at 3° C. (37°.4 F.); dissolves in fuming nitric acid and in concentrated sulphuric acid, and, upon heating, it is then converted into *dinitrobenzene* $C_6H_4(NO_2)_2$.

Nitrobenzene is used in the arts for preparing aniline, and by soap manufacturers for scenting soap, under the name, *oil* or *essence of mirbane*. It is also called *artificial oil of bitter almonds*, and has been used to adulterate the genuine bitter almond oil. Professor J. M. Maisch has proposed the following method for detecting the presence of nitrobenzol in oil of bitter almonds: Dissolve one part of the suspected oil in two or three parts of alcohol, then add half a part of pure fused caustic potassa, and heat gently to dissolve the potassa, and evaporate the mixture to about one-third its original bulk. Set this aside, and when cool, if the oil of bitter almonds be not adulterated with this agent, it will remain fluid; but if nitrobenzol be present, a greater or lesser amount of crystalline deposit will be observed, according to the degree of adulteration. *Am. Journ. Pharm.*, November, 1857.—L.

Properties and Uses.—Nitrobenzol is a very poisonous agent, causing death in very small doses;[1] and, whether its toxical effects be due to internal or external employment,—occasioning vertigo, nervous and muscular prostration, spasms, convulsions, dilatation of the pupils, dyspnœa, irregular action of the heart, and eventually death; consciousness being retained the most of the time. These symptoms vary in severity and in rapidity of appearance, according to the amount of the dose employed, and are supposed to be owing to the conversion of the nitrobenzol in the system into aniline. The pathological conditions after death are, congestion of the lungs, heart, and brain, and a dark, tarry appearance of the venous blood. It should never be employed in therapeutics, though it has been advised as a local remedy in the treatment of itch and parasitic cutaneous maladies; but even in these affections dangerous symptoms have followed its employment. The best means to employ in cases of poisoning by this agent, are stimulants internally, as carbonate of ammonia, etc, and externally, electro-magnetism, frictions, and baths as hot as can be used without impairing the integrity

[1] *Letheby, Lond. Pharm. Journ.*, Sept., 1863.

of the skin, together with the application, at the same time, of cold douches to the head and along the vertebral column.—K.

PANCREATINUM.

PANCREATIN.

History.—The *pancreas* (*all flesh*) is a long, flat, conglomerate gland, analogous in its structure to the salivary glands, and which is situated transversely across the posterior wall of the abdomen, behind the epigastric and the two hypochondriac regions. In animals it is called the *sweet-bread.* It secretes a fluid termed the *pancreatic juice*, which is injected into the duodenum, and there mixing with the bile from the liver, and the chyme from the stomach, it helps to convert the latter pulpy substance into *chyle.* The pancreatic juice is a colorless, strongly alkaline liquid (specific gravity 1.008 or 1.009), of which the soluble constituents are from $1\frac{1}{2}$ to $2\frac{1}{2}$ per cent. of several albuminous matters resembling ptyalin in action. It has the power to emulsify fats (some believe also to convert them into glycerin and fatty acids), to convert starchy matters into dextrin and glucose, and to dissolve albumen and fibrin.

Preparation.—PANCREATIN is the name given to the purified dried juice of the pancreas, or to the precipitated albuminoids of this juice. Professor E. Scheffer recommends, in order to obtain pancreatin, that the recent beef pancreas be chopped very finely, and be digested for twenty-four hours in water acidulated with muriatic acid; this is then strained and the fluid filtered. To the filtered fluid, carbonate of lime is added to neutralization, when it is again filtered, and then mixed with an excess of alcohol; the resulting precipitate is carefully dried.

Mr. R. V. Mattison proposes a process similar to that of Professor Scheffer for obtaining pepsin, viz.: Precipitate the acidulated solution of the pancreatic juice with a saturated solution of sodium chloride; skim this, and press the precipitate, mixing the magma with milk sugar in such proportion that ten grains of the mixture shall emulsify one hundred and twenty grains of cod-liver oil. For this preparation he suggests the name *saccharated pancreatin.* The process employed by the Paris Pharmaceutical Society is, to bruise the pancreas, digest it in water containing a little chloroform (to prevent decomposition), press and filter the liquid, and then evaporate it in a current of cool air. This is, in reality, the dried pancreatic juice.

Pancreatin possesses the power of emulsifying a very large amount of fat or oil. When dried, it has a yellowish color, is brittle, odorless, and almost transparent, forming a neutral, yellowish solution in cold water; if it has the odor of animal matter it should be discarded.—L.

Properties and Uses.—Pancreatin has been recommended in atonic dyspepsia, due either to impaired secretion or defective composition of the juices secreted; in acid dyspepsia, the result of the abnormal transformation of the food in the stomach, from morbid condition of the gastric juice; in flatulent dyspepsia; and in the dyspepsia of children who are fed chiefly upon milk and amylaceous diet, and who often suffer therefrom, with emaciation and diarrhea. As nature has furnished the pancreatic juice to effect the conversion of chyme into chyle, in the duodenum, and probably with the aid of the presence of bile; and as the pancreatin must certainly undergo some change from the action of the juices of the stomach previous to its entrance in the

duodenum, it is somewhat puzzling to clearly understand the utility of pancreatin in the stomach, at least until the food has been wholly converted into chyme; besides, when digestion is sluggish or becomes difficult, this is not entirely owing to the deficiency of the gastric, pancreatic, or intestinal juices, but generally to a more radical change in the secretion and composition of these juices, dependent upon an abnormal condition of the organs secreting them. However, pancreatin is an inoffensive agent, and may be conveniently tested in the cases in which it has been advised; and if, after ten or twelve days, no benefit is derived from it, its use should be suspended. Its dose is three or four grains, about an hour after meals. It may be made into pills of three grains each, with a sufficient amount of honey; or one drachm of it may be mixed with fifteen grains of phosphate of lime, and the mixture be divided into ten doses.—K.

PENTHORUM.

Nat. Ord.—Crassulaceæ.

The whole herb of Penthorum sedoides, *Linn.*

Common Name.—Virginia Stone-crop.

Description.—This is an erect perennial herb, about a foot high, found growing in creeks and wet situations throughout the United States and Canada. The *stem* is smooth, round at the base, but angular above, and often branched. It has numerous scattered, thin *leaves*, from two to three inches long, about one-third as wide, and attached to the stem at an acute angle. They are lanceolate, smooth, finely and sharply serrate, tapering regularly to an acute apex, and at the base to a very short leaf-stalk. The *flowers* are small, inconspicuous, and arranged in terminal naked cymes, consisting of from two to four slender, simple, one-sided branches, which unroll as the flowers expand. The flowers are supported on short peduncles about an eighth of an inch long, and consist, each, of a five-parted calyx, ten stamens, and five pistils, which are united at the base. The *petals* are generally wanting. The *fruit* consists of five dry, one-celled capsules, beaked with the persistent style, and united at the base. They open, when ripe, at the summit, and are filled with numerous minute seeds. The genus Penthorum, which differs from its allies of the Crassulaceæ in not having fleshy stems, consists of only two species,—the one described above, indigenous to North America, the other found only in China.

History.—Penthorum sedoides was mentioned by some of the older authorities, but its recent introduction into medicine may be ascribed to Dr. F. H. Briggs.[1] The fresh herb has an astringent, slightly acid taste, and, when bruised, an herb-like odor. The properties of the fresh plant are best extracted by alcohol, and seem chiefly to depend upon a form of tannin which, in alcoholic solution with ferrous sulphate, first turns blue and then precipitates black. With ferric sulphate, it forms a deep-green solution. Neither the tincture, nor the tincture freed from tannin, show the slightest indication of an alkaloid with the ordinary reagents. When the herb is distilled with water, the distillate is free from volatile oil.—L.

Properties and Uses.—Dr. Briggs states that "the older authorities

[1] *E. M. Journal*, 1875, p. 479.

gave this agent as a demulcent and laxative, and it does not seem to exert the astringent action common to agents containing tannic acid. The impression upon the mouth is that of an astringent; but on examining the mucous membrane, it does not seem corrugated, but very fresh and rosy, and it would undoubtedly prove a valuable tooth and mouth wash." The fluid extract has been employed successfully in the treatment of cholera infantum, diarrhea, and hemorrhoids. Prof. J. M. Scudder observes that mucous membranes, especially when they have suffered from inflammatory action, are peculiarly influenced by this agent, which gradually removes irritation, promotes normal functional activity, and restores the tissues to their normal condition. He has found it not only an excellent remedy in diarrhea, but likewise in chronic nasal catarrh, in chronic pharyngitis, in chronic bronchitis with increased secretion, and in chronic vaginitis with or without leucorrheal discharge. He employs it internally, and locally, when this can be effected, in spray; also as a topical application to chronic ulcers. The dose of the fluid extract is from ten to sixty minims, repeated every three or four hours; of the specific tincture, two or three minims, in a teaspoonful of water.—K.

PEPSIN.

PEPSIN.

A constituent of gastric juice.

History.—Pepsin is related to the proteids, and is found in the gastric juice. It was supposed to be a protein body, until Mulder obtained digestive fluids free from proteic reactions. It possesses the power, in connection with hydrochloric and some other acids, of dissolving coagulated albumen and muscular fiber, converting them into what is known as *peptones*. The name *pepsin* was first used about 1836, by Schwann, who obtained the "digestive principle" by macerating cleaned stomachs in acid-water, precipitating the liquid with mercuric chloride, and separating the mercury with sulphide of hydrogen. Commercial pepsin was first prepared by drying the glandular layer of the stomach of the pig or calf, at low temperatures, and powdering the product. Boudault's process (*Squire*) is to open the rennet-bags of sheep, wash them in a gentle stream of water, then scrape the mucous membrane with a knife, digest the scrapings or pulp twelve hours in cold distilled water; filter, add to the filtrate solution of acetate of lead in slight excess, collect the precipitate, decompose with sulphide of hydrogen; again filter, and wash the precipitate slightly with distilled water; evaporate the filtrate, at a temperature below 100° F., to the consistence of a syrup, and add starch, in such proportion, that one part of the mixture will dissolve four parts of fibrin. In 1862, Mr. Burk suggested the use of lime-water as a precipitant.

Preparation.—In 1872,[1] Prof. E. Scheffer announced the formula for making saccharated pepsin now generally used by manufacturers, a process that is easy and practical. We can not too highly commend the principle which induced Mr. Scheffer to make public that which certainly was valuable private property, and we feel that pharmacists and the medical profession generally acknowledge their indebtedness for the act.

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[1] *American Journal of Pharmacy*, 1872, p. 49.

SACCHARATED PEPSIN. (*Scheffer's process*)—Dissect the mucous membrane from well-cleaned hogs' stomachs, chop it fine, and macerate it for several days, in water acidulated with hydrochloric acid; strain the resulting liquid, and mix it with its bulk of saturated solution of chloride of sodium. The pepsin now separates, will rise to the surface, and must be skimmed off, drained upon a muslin strainer, and submitted to strong pressure to rid it of salt; then, while still moist, it is to be mixed with milk-sugar, in such proportion that ten grains dissolved in one fluidounce of water acidulated with hydrochloric acid, will dissolve one hundred and twenty grains of coagulated albumen, at about 38° C. (100° F.), in from four to six hours.

Chemical Properties.—Pepsin is only active in an acid solution, more so with hydrochloric acid than lactic or other acids; from 0.08 to 0.20 per cent. of the former acid being more suitable. Neutralization suspends the action of pepsin; alkalies and alcohol injure it; boiling destroys it. Precipitated dry pepsin, exhibited by Mr. Scheffer, resembles parchment paper, or, as he states, "sole leather," the color ranging from light-straw to brown. The colored article contains a small proportion of calcium phosphate, and sodium chloride, which do not interfere, in the least, with its digestive powers; but, on the contrary, are beneficial, as pure pepsin, reprecipitated by means of alcohol, failed to dissolve as much albumen, in Mr. Scheffer's hands, as the crude or colored article.

Pepsin, after having been dried, swells in water, dissolves slowly, but in small proportion. When freshly precipitated, it is very soluble. Solution of pepsin is almost neutral, yields a transparent gelatinous precipitate with alcohol, and coagulates on boiling. Bichloride of mercury and nitrate of lead give white precipitates with it. Aqueous solution of pepsin will scarcely dissolve coagulated albumen, but the addition of a few drops of hydrochloric acid renders it at once an active solvent; the cause of its action is not understood. Pepsin is not destroyed by the process of digestion. After it has ceased to act, the addition of another supply of acid apparently regenerates it, and renders it capable of again performing the part of a digestive agent; and, according to Mr. Scheffer's experiments, the alternate addition of hydrochloric acid and coagulated albumen, resulted in a complete solution of fifteen hundred grains of the latter substance by means of one-half grain of purified pepsin, slightly acidulated. Pepsin curdles eighty thousand parts of milk.

Pepsin is officinal in the *British Pharmacopœia*, the process being to simply scrape the washed mucous lining of the fresh stomach of a sheep, calf, or pig, with a blunt instrument, place the pulp in a thin layer on glass, and dry at a temperature not to exceed 100° F. This, of course, contains animal matter. Pepsin should be odorless, or nearly so. If it gives a disagreeable odor, the specimen should be rejected.

LIQUID PEPSIN (*Scheffer*)—"Take of Saccharated Pepsin sixty-four grains, water five fluidounces, muriatic acid one fluidrachm; after solution, add glycerin three fluidounces, then mix and filter. One fluidounce dissolves ninety grains of coagulated albumen."—L.

Properties and Uses.—Previous to the introduction of pepsin, it was a common course among several nations, and in domestic practice, to collect the gizzards of chickens, ducks, turkeys, pigeons, and other birds, remove their inner mucous membranes, dry them, and then reduce them to powder; and this powder, now called *ingluvin*, either alone, or in combination with other substances, was administered in derange-

ments of the digestive organs. Pepsin, properly prepared, answers a much better purpose, but to be of efficacy, it must not be united with starch, bismuth, wine, alcohol, or other substances that impair or destroy its peculiar properties. The articles with which it may be combined without injury are, in the form of powder, sugar of milk, or silica, and in fluid form, glycerin, or acidulated water and glycerin, which will preserve it for a considerable period. Pepsin, while aiding or correcting digestion, exerts no influence upon the various lesions upon which the impaired digestive process depends; though it may, in certain cases, afford such relief to this process as to permit the natural recuperative energies of the system to effect recovery. It frequently affords relief in various forms of indigestion, or of dyspepsia. Infants of delicate constitution, suffering from gastric derangements either previous to or during the period of dentition, as manifested by tumid abdomen, emaciation, diarrhea, and often a tendency to vomit, will derive much benefit from its use, during the administration of which these symptoms will disappear, and the sufferings from dentition will be greatly mitigated. Among those infants raised artifically, upon cow's milk, and with whom this fluid does not readily digest, pepsin has likewise been recommended; it may be serviceable in some instances of this kind, though it appears to me that liquid rennet would answer a much better purpose.

In cases of sick headache due to gastric acidity, large doses of pepsin, taken shortly after meals, will tend greatly to postpone or prevent the cephalalgic attack. It will also be of value in the feeble or tardy digestion attending convalescence from exhausting febrile or inflammatory maladies, and that present during long-standing chronic diseases. According to M. Liebreich, pepsin is *contra-indicated* in carcinoma, and ulceration of the stomach, in which its administration would tend to hasten the process of thinning the diseased portion of the gastric walls. M. Castro (1868) has successfully used hypodermic injections of an acid solution of pepsin for the removal or diminution of tumors, passing the injection directly into their substance. Pepsin, to be of service, must be pure and reliable, and the more recent its preparation the more satisfactory will be its effects. The dose of saccharated pepsin is from ten to sixty grains, taken shortly after each meal; it may be taken alone in the mouth, and then washed down with a draught of water, or it may be mixed in equal parts of water and pure glycerin; of pure pepsin, from two to ten grains; of liquid pepsin, from two fluidrachms to two fluidounces.—K.

PILOCARPUS PENNATIFOLIUS.

Nat. Ord.—Rutaceæ. *Tribe.*—Xanthoxyleæ.

The mature leaflets of Pilocarpus pennatifolius, *Lemaire.* (*Syn.*—P. pinnatus, *Martius.*)

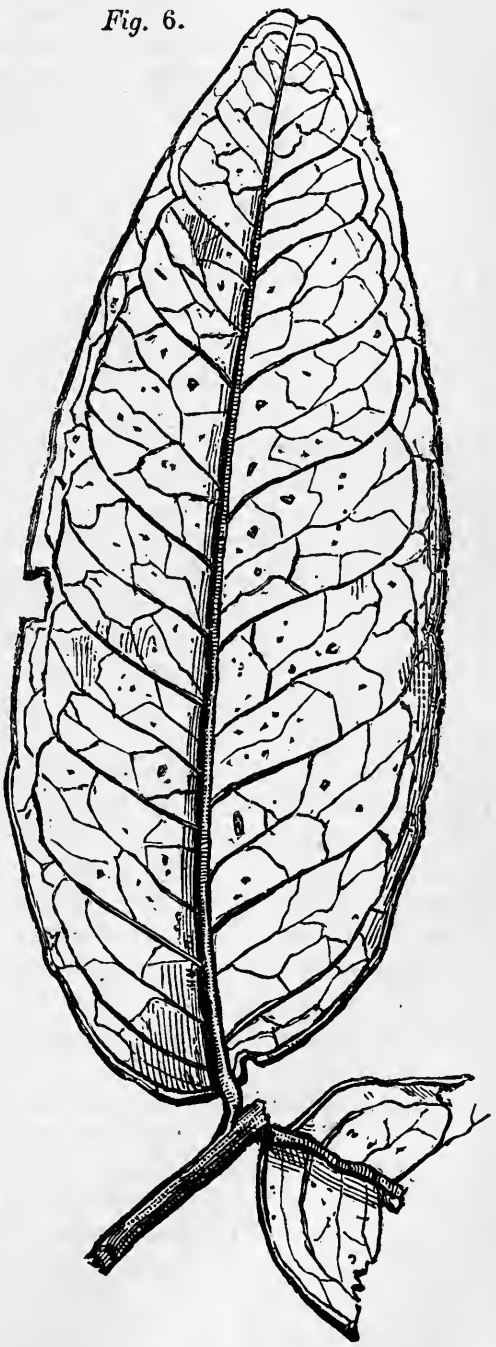
Common Name.—Jaborandi.

ILLUSTRATIONS.—*B. and T. Med. Plants*, No. 48; *Pharm. Journ. and Trans.*, 1875, p. 582; our *Fig.* 6.

Description.—Jaborandi was first introduced to the medical world by Dr. S. Continho, of Pernambuco, in 1874. The leaves were examined by Prof. Baillon, and the plant referred to the Pilocarpus pennatifolius of Lemaire, which is a Brazilian shrub, described by Engler as having

pilose leaves. The leaves of the commercial Jaborandi are perfectly smooth, and E. M. Holmes, who investigated the subject in 1875, and figured the leaves and fruit in the *Pharmaceutical Journal and Transactions*, found them to correspond with the description of Pilocarpus Selloanus (*Engl.*), as mentioned in the *Flora Braziliensis*, excepting that the pedicels are not so slender. The Jaborandi shrub is a native of Brazil, and grows to the height of from four to six feet. The genus is represented by about a dozen described species, natives of South America and the West Indies. The *flowers* are small, and disposed in terminal, slender, spicate racemes. The petals, sepals, and stamens are five, and the ovary has five carpels, partially inclosed in a fleshy disk. The *fruit* consists of five (or, generally by abortion, of two or three) two-valved carpels, each of which contains a single hard black seed. The *leaves* are alternate, exstipulate, with two or three pairs of opposite leaflets, and an odd one. The leaflets (see *Fig.* 6), as found in commerce, are thick, leathery, entire, and of a light-brown color. They are oblong, slightly tapering at the base, and retuse at the apex. (The engraving in *Bent. and Trimen's Med. Plants* represents them as acute.) The mid-rib is very prominent underneath, and extends to the notch in the end. The veins are reticulate, and confluent near the margin of the leaf. When the leaflet is held between the eye and the light, numerous, small, pellucid oil-glands can be seen, scattered irregularly throughout the leaflet.

Fig. 6.



Jaborandi leaflet.
Natural Size.

History.—Commercial jaborandi is usually mixed with leaf-stalks, twigs, and bark. The leaflets are almost odorless when entire; at first have a slightly aromatic taste, which is followed by a persistent acridity, attended with an increased flow of saliva. In 1875, Byasson found, in the specimens sent by Dr. Continho, a small quantity of volatile oil, and an alkaloid, for which he suggested the name *jaborandin* (*Repertoire de Pharmacie*, March 25th, 1875). In May (1875), Mr. A. W. Gerrard reported an alkaloid, and named it *pilocarpin*, a name previously suggested by E. M. Holmes, in anticipation of an alkaloid from the plant. Subsequent examinations gave Mr. Gerrard uncrystallizable salts; also sulphate, hydrochlorate, and nitrate of pilocarpin, in crystals. Since that time, several other crystallizable

salts of this alkaloid have been obtained, some being very deliquescent. Hardy likewise succeeded in crystallizing the hydrochlorate. Both Gerrard and Hardy report the existence of a *second* alkaloid, which crystallizes (*Gerrard*) from the mother solution, from which pilocarpin has been separated, upon the addition of an excess of nitric acid, but this requires confirmation.

Pilocarpin may be obtained by extracting the leaves with alcohol, distilling, dissolving the residuum in water, filtering after twenty-four hours, evaporating the filtrate to the consistence of syrup, adding ammonia water in slight excess, agitating the mixture with chloroform, and evaporating the chloroform. It may be purified by re-solution in chloroform. Pilocarpin is amorphous, of a yellowish or greenish color, and of a thick gummy consistence. Kingsett (*Journ. Chem. Soc.*, Oct., 1876) reports that it is the *only* alkaloid present in the leaf, and ascribes to it the composition $C_{23}H_{34}N_4O_4$, and to a platinum compound of it, $C_{23}H_{34}N_4O_4 2HCl,PtCl_4$. According to the same authority, when distilled with caustic potassa, it yields *trimethylamin*. The hydrochlorate of pilocarpin is the form of the alkaloid generally used by physicians; it occurs in colorless crystals.

Hardy's process for obtaining the *hydrochlorate of pilocarpin* is as follows: Coarsely powder jaborandi leaves and make an infusion of them; strain, and evaporate to the consistence of an extract; then treat this with alcohol, and again evaporate. The product thus obtained, and which contains the active principles of the jaborandi, in a small volume, is again taken up with water, and the resulting solution, after being decolorized by acetate of lead, is treated with corrosive sublimate; a precipitate is obtained of the double chloride of mercury and of the alkaloid sought for; this precipitate is collected, thoroughly washed, then mixed with water and decomposed by sulphureted hydrogen, which precipitates the mercury, and sets the alkaloid free, in the form of hydrochlorate. Filter, evaporate by a gentle heat, when a slightly colored crystallized salt will be obtained, which is the hydrochlorate of pilocarpin.

Nitrate of pilocarpin was first made by Petit, and noticed by him in *Repertoire de Pharmacie*, August, 1875. It is soluble in eight parts of water, at 15° C. (59° F.), in seven parts of boiling alcohol, and slightly soluble in cold alcohol. The solution of this salt is precipitated by chloride of gold, in fine needles, and by chloride of potassium in prismatic crystals.—L.

Properties and Uses.—Jaborandi acts upon the glandular system, increasing the secretory action of the glands; however, its influence is more especially exerted upon the sudoriparous and salivary glands. A drachm or two of the powdered leaves and smaller branches infused in a cupfull of boiling water, and the whole taken at a draught, will, in about ten or twenty minutes afterward, occasion a tingling sensation with redness of the cutaneous surface; this sensation is at first experienced in the face, but soon extends over the whole surface, and is quickly followed by an abundant perspiration, which is apt to continue for four or five hours. Almost simultaneously with the sweating, the secretion of saliva increases to such an extent as to greatly embarrass speech, the party being often obliged to assume an inclined position that the escape of the saliva may be facilitated. During its salivary action a pint or two of saliva, and even more, may be secreted, and, not unfrequently, there will be, in addition, an augmentation of the bronchial and lachrymal secretions. At times the mucous glands of the in-

testines will be so influenced as to occasion a diarrhea, and it is not a rare circumstance that the submaxillary glands enlarge. After the administration of jaborandi, patients are often attacked with nausea, vomiting, vertigo, hiccough, heaviness of the head, and contraction of the pupils. According to S. Ringer and A. Gould, the temperature of the body becomes greatly lessened during the sweating, falling to 1°.4 F.; on the other hand, Green, Rabuteau, Gubler, Robin, Ambrosoli, and Riegel, state that it becomes considerably elevated. As the rule, at the termination of the diaphoresis, the temperature becomes the same as it was at time the jaborandi was administered; in a few cases, it has been slightly lower, but returned to the normal degree in the course of from twelve to twenty-four hours. From the commencement of the perspiration, the face becomes pale, the pulse fuller and more frequent; the pulsations of the heart become irregular, and, with persons laboring under some cardiac affection, a kind of asystolia is observed. The effects of this agent have been found to occur more readily with adults than with children. In the exhibition of this article as a diaphoretic, the use of warm drinks, and other aids toward facilitating the sweating, are not required.

During the sudorific action of jaborandi, the quantity of urine is lessened, to a greater or lesser extent, and micturition frequently proves painful. As urea exists to a large extent in the saliva and sweat caused by jaborandi (no uric acid being found), a diminution of it occurs in the urine voided; but, after the sweating, it gradually returns to its normal figure, in the urine, and from this it would appear that the drug does not increase the combustions of the economy. Experiments with the sphygmograph, made at various periods during the action of the drug, have shown an almost complete asystolia with a very considerable diminution of vascular tension. M. Robin is led to believe that jaborandi has an especial action upon the vaso-motors, which it paralyzes; from whence results the cardiac asystolia and the copious secretions of sweat and saliva. M. Gubler, while admitting this paralyzing action upon the vaso-motors, maintains that it has, in addition, a special irritating influence upon the sudoriferous and salivary glands, and upon the renal glomerules, which stimulates their functional activity. Dryness of the mouth and throat, with a sense of fatigue and depression, most usually follow the cessation of its active effects. Administered in divided doses, jaborandi, instead of acting as a diaphoretic and sialagogue, becomes an active diuretic. When given in cases where there is a diminished secretion of milk, contrary to what might be anticipated, it increases the quantity of this mammary secretion. Martindale dissolved extract of jaborandi in glycerin, and applied it around the eye; a marked contraction of the pupil ensued. A similar result, with impaired vision, is apt to follow its internal administration, but which disappears on the cessation of the medicine. Pilocarpin is evidently the active principle of jaborandi, having an action nearly identical; however, it causes less salivation, less vomiting, and is more certain in its effects,—the hydrochlorate, and the nitrate of this alkaloid, are used; they may be employed internally, or by subcutaneous injections.

Therapeutically, jaborandi has been found of value in the removal of serous effusions, as in hydrothorax, anasarca, ascites, chronic pleurisy, etc., whether these be due to maladies of the heart, liver, kidneys, to chronic inflammatory conditions, to albuminaria, or exist as a sequence of exanthematous affections, etc. While in certain of these effusions it acts as a curative agent, in others it will prove useful as affording tem-

porary relief, from time to time, until other indicated remedial agents have been enabled to overcome or to modify the abnormal conditions giving rise to such effusions. In cardiac diseases, from its tendency to diminish the contractility of the heart and arteries, and to favor their dilatation (diastole), thus conducing to dyspnœa and even to asphyxia, if used at all, great care and prudence should be observed. In those maladies, in which its employment from time to time is followed by persistent debility, it is contra-indicated.

Jaborandi has been used with more or less success in the following maladies: Asthma, bronchitis (with or without emphysema), albuminous diabetes, dropsies, in cases of poisoning, and diseases due to miasms or morbid poisons (puerperal septicemia?), eruptive fevers impeded in their evolution, etc. (*Gubler*); in metastatic orchitis (*Czernicki*); in polyuria (*Laycock*); in chronic rheumatism, syphilitic rheumatism, and in acute articular rheumatism, but in which the endocarditis was aggravated (*Fereol*)—this author has also observed an attack of gout, and an increase of the intensity of hemicrania, in cases where it was administered; in the albuminaria of pregnancy its use was followed with hematuria (*Langlet*); in acute albuminous nephritis (*Bloch*)—this author likewise states that jaborandi will be found efficacious in chronic parenchymatous nephritis, especially when the renal lesions are not of long standing; that the existence of uremic phenomena is not an absolute contra-indication of the drug; that it is seldom of service in interstitial nephritis; and that it should be employed with the greatest caution when cardiac lesions are present. Petithau advises its employment in all subacute or chronic catarrhal or rheumatic affections; in dropsies, when there is no morbid change of the kidneys, and anemia is but slight; in pernicious intermittent fevers; in psoriasis and other dry forms of cutaneous maladies; in chronic syphilitic affections, etc. The effects of this drug in the diseases named have been denied by many writers, and further experiments are necessary before medical men can venture to confidently rely upon it, except as a diaphoretic and sialagogue.

Its alkaloid has been used in the form of hydrochlorate, and nitrate of pilocarpin, and which have been employed in the same diseases as the infusion of the leaves. The effects of the alkaloid are said to be more certain than when the leaves are used, and the tendency to nausea and vomiting is greatly diminished. Beranger considers the hydrochlorate of pilocarpin of great value, therapeutically, in certain eye diseases; he uses it in instillations, and in subcutaneous injections, two very distinct effects being obtained, according to the method employed. By injections, profuse discharges follow, accompanied with a diminution of ocular tension, and a more rapid renovation of the media of the eye; this form of use he considers indicated in acute and chronic glaucoma, iritis, floating bodies in the vitreous substance, certain opacities of the cornea, and in poisonings. Sometimes complete recovery will ensue; at others, great relief follows. His solution was made by dissolving three grains of the hydrochlorate of pilocarpin in seventy-five minims of cherry-laurel water, of which solution from ten to fifteen drops were injected at a time. By instillations, he employs it as a powerful myotic in mydriasis, and prefers it to eserine, as it is accompanied with no irritation. He likewise prefers it, in instillation, to eserine, in disturbances of vision associated with secondary paralysis and characterized by asthenopia, with feebleness of the intrinsic muscles of the eye, and also in certain cases of presbyopia which is not constant but returns at

different periods. Dr. Landesberg, of Philadelphia, has found both the fluid extract of jaborandi, internally, and the hydrochlorate of pilocarpin, by subcutaneous injection, more effective and reliable than any other known remedy, in intraocular hemorrhages, and in opacities of the vitreous and aqueous fluids; but he prefers eserine to pilocarpin as a myotic, on account of the increased action of the lachrymal and salivary glands, occasioned by the latter, when absorbed. Gillet de Grandmont, of France, has used the nitrate of pilocarpin, by subcutaneous injection, in the forearm, of from one-seventh to one-half of a grain, in solution; and has found surprisingly good results to follow in specific or rheumatic iritis, either simple, or complicated with alterations of the cornea, in the keratitis of Hutchinson, in dimness and hemorrhage of the vitreous body, in glaucoma, in atrophy of the choroid, in hemorrhages and plastic exudations of the retina, and in commencing atrophy of the optic nerve. In all the above-named maladies, the agent produced its usual results, as sweating, increase of the cardiac pulsations, etc.

M. Armaingaud considers this agent as one that will eventually be of great benefit in therapeutics; at present, he deems it the remedy of the future, the proper action of which is not yet fully known. He cites, among his patients, one case in which a tumor of the eye was, previous to his attendance, treated with subcutanous injections of pilocarpin by an eminent oculist in Paris, and which produced so much weakness and emaciation as to require a treatment of more than two months to effect a recovery, the tumor all the time remaining intact. And he especially cautions against the abuse of this remedy, which, though powerful and efficacious in many cases, may, with certain patients, occasion serious and even fatal effects. M. Badal concurs in these views.

The dose of jaborandi in infusion, forty-five grains to two fluidounces of water, is one fluidounce, which may, if necessary, be repeated every ten or fifteen minutes; of the fluid extract, from ten drops to a drachm and a half; of pilocarpin, or its salts, internally, from one-fourth of a grain to three-fourths of a grain; by subcutaneous injection, one-sixteenth of a grain to one grain, in solution. In cases where the internal exhibition of jaborandi by mouth, occasions nausea or vomiting, this may be avoided in giving the dose, by rectal enema.

According to M. Rabuteau, coffee is an antagonist of jaborandi; when given concurrently with it, it will prevent the nausea and vomiting, and likewise appears to diminish the perspiration as well as the excretion of the urea. The effects of jaborandi upon the human system are also counteracted by subcutaneous injections of solution of atropia; while those of belladonna or atropia are overcome by subcutaneous injections of pilocarpin. But this antagonism does not invariably appear, as the symptoms following the administration of one of these substances, are not always counteracted by the employment of the other; besides while the dose of jaborandi or pilocarpin may always be readily determined, that of belladonna, and especially of atropia, is so difficult to regulate, that extreme circumspection is required.—K.

PIPER METHYSTICUM, *Miq.*

Nat. Ord.—Piperaceæ.

The root of Piper Methysticum, *Forst.* (*Syn.*—Macropiper Methysticum.)

Common Names.—Ava, Kava-kava, Intoxicating long pepper, Ava pepper shrub.

Description.—This is a shrub about six feet high, a native of, and common in cultivation in, the Pacific Islands. The *leaves* are alternate, cordate, with a wavy, entire margin, and an abrupt, acute point. The petiole is about an inch long, dilated at the base, and furnished with linear, erect stipules. The veins are prominent, about twelve, diverging from the base of the leaf-blade. The *flowers* are small, apetalous, and arranged on slender spikes. Those bearing male flowers are axillary and solitary. The females spikes are numerous.

History.—This shrub is known, in its native country, the South Sea Islands, under the names, *Kava*, *Ava*, *Arwa*, *Ava-kava Kava-kava*, etc., and is the "Intoxicating Long Pepper," from which a disgusting drink is prepared by the natives, and even by the whites, of these islands. This drink is invariably made by chewing the root of the plant to a pulp, covering this with water, macerating a short time, and then straining it. The taste is said to resemble soap-suds and tannin.[1] The leaf is used to chew with the betel-nut, and the dried root, under the name *pipula-moola*, forms an article of commerce in India.

The root is the part recommended for use in medicine. Of the lot inspected by us, the main root seems to have grown horizontally beneath the surface of the ground, sending up stalks at intervals of from two to four inches. Each stalk is from half an inch to three inches in diameter at the base, and is hollow. The cavity extends through the main root, thus giving to a longitudinal section of the root the appearance of several separate roots having grown together. Externally, the main root is brown, and covered with a thin bark. From the sides and lower part are secondary roots, about one-half or three-fourths of an inch in diameter; these appear to be arranged about the bases of the stalks; in some cases they are quite long, and commence to send out rootlets at a distance of six inches from the main root. Internally, the large root is covered with a net work of fibers beneath the bark. Coarse medullary rays compose the body. The root breaks with a fibrous fracture; it is frequently much worm-eaten internally, though, to an external examination, apparently sound. After chewing a little of it, it imparts a peculiar acrid, benumbing sensation to those parts of the mouth with which the pulp comes in contact; this property is possessed in a much greater degree by the small rootlets.

From an analysis made by Gobley (1857), we learn that *Piper methysticum* root contains an acrid, aromatic resin, gum, extractive matter, a large proportion of starch, and other organic and mineral constituents common to most plants, besides a peculiar crystalline body named *methysticin*. This latter substance is colorless, odorless, neutral, and tasteless; fuses at 130° C. (266° F.), and decomposes at a higher temperature; it is very soluble in hot alcohol and volatile oils, and only

[1]For descriptions of use by the natives of the various Pacific Islands, see *Gentleman's Magazine*, Sept., 1879; *Johnson's Chemistry of Common Life;* and Dr. Seeman's letters from the Feejee Islands, in the *Athenæum*, 1861.

slightly so in the above menstruums when they are cold, and scarcely, if at all, soluble in water. It dissolves in hydrochloric acid, with a yellow, in nitric with a red; and in sulphuric acid, with a blood-red color. M. Cuzent obtains *methysticin* or *kavain* by directly treating the coarsely-powdered root of kava with alcohol, in a displacing apparatus, filtering the yellow liquor obtained, concentrating it by distillation, and then leaving it to crystallize. Separate the crystals formed, and place them in a glass funnel, lightly tamponed with soft cotton; wash them with weak alcohol, and then re-dissolve in alcohol of 84°. When the solution is completed, add washed animal black to decolorize it, then boil it for a few minutes, and filter the liquor, which, as it cools, allows the kavain to be deposited in white crystalline tufts.—L.

Properties and Uses.—The root of Piper methysticum has a pleasant, somewhat lilac odor, and a slightly pungent, bitter, and astringent taste, and which augments the salivary discharge. It has been employed as a pleasant remedy in bronchitis, rheumatism, gout, gonorrhea, and gleet, and has also been recommended as a powerful sudorific. It appears to exert its influence more especially upon diseased mucous membranes, and may be found useful in chronic catarrhal affections of various organs, and in chronic inflammation of the neck of the bladder. The action of the root varies, according to the amount taken; in small doses, it is tonic and stimulant; while in large doses it produces an intoxication, which, unlike that from alcohol, is of a reserved, drowsy character, and attended with confused dreams. The natives who use its infusion as an intoxicating beverage for a considerable length of time, are said to become affected with a dry, scaly, cracked, and ulcerated skin, and vision becomes more or less obscured. M. Dupouy, who has given considerable attention to the therapeutical virtues of this drug, arrives at the following conclusions: Given in drink, kava is a sialagogue, but it is not sudorific. In medicinal doses, it acts upon the stomach, similar to the bitter stimulants, increasing the appetite, without occasioning diarrhea or constipation, and may prevent catarrhal affections of this portion of the digestive tube. It exerts a special stimulation upon the central nervous system, differing essentially from ethylic intoxication; and as its taste is agreeable, one soon becomes a proselyte to it. It has a very powerful action upon aqueous diuresis, and may be classed among the most efficacious diuretics. It does not occasion priapism; but, on the contrary, antagonizes it. It is endowed with remarkable and prompt blennostatic properties, augmenting the discharge previous to effecting its cure. It is of undoubted efficacy in acute vaginitis or urethritis, allaying the inflammation, causing the pain during micturition to disappear, when dysuria is present, and suppressing the muco-purulent catarrh from the vesico-urethral mucous membrane. It has, over other blennostatic agents, the marked advantages of being pleasant to take, of augmenting the appetite, of occasioning neither diarrhea nor constipation, of alleviating or entirely subduing pain during urination, of completely changing the character of the discharge, and of effecting the cure in a very short time—ten or twelve days. He can not too highly recommend its employment, especially in the treatment of gonorrhea. The anti-catarrhal action is probably due to the resin present, and the diuretic effects to the neutral crystallizable principle, *methysticin* or *kavain*. There may likewise be present some other active principle, not yet detected, to account for certain other influences following its employment. Sixty or seventy grains of the scraped root, macerated for about five minutes in a quart of water,

may be taken in the course of twenty-four hours, repeating this quantity daily, as long as required. The dose of the fluid extract of the root is from fifteen to ninety minims, in a glass of water, repeating the dose every three or four hours.—K.

POLYMNIA.

Nat. Ord.—Compositæ. *Tribe.*—Senecionideæ.

The root of Polymnia Uvedalia, *Linn.*

Common Name.—Bearsfoot.

Description.—This is a large perennial plant, from three to six feet in height, and found, in ravines, on the edges of woods, etc., in the Central States, from Illinois to Florida. The *stems* are erect, stout, branched, and covered with a rough, hoary pubescence. The *leaves* are large, thin, opposite, deltoid in outline, and abruptly contracted at the base to short dilated leaf-stalks. They are three-lobed, with acute, sinuate-angled lobes, bright-green on both surfaces, and studded below with numerous rough points. The *flower-heads* appear late in summer, and are disposed in loose, corymbose clusters. The involucre is double; the outer consisting of about five ovate, obtuse, leaf-like scales, which are ciliate on the margin; and the inner, of the smaller thin bracts of the pistillate flowers. The flower-heads are radiate, and the receptacle chaffy. The ray flowers are about ten, in a single row, each being nearly an inch in length; they are oblong, of a bright-yellow color, and equally three-toothed at the apex. The ray flowers are pistillate, and alone fertile, as the disk-florets, although perfect, do not produce fruit. The *fruit* is an obovoid, black achenium, slightly flattened, and ribbed lengthwise.

POLYMNIA CANADENSIS is a smaller plant than the preceding, and is found in similar localities The *stems* are clammy, pubescent, and have long internodes. The lower *leaves* are pinnately-parted, the upper ovate, five-lobed, abrupt at the base, sub-regularly sinuate-toothed, and on slender, horizontal leaf-stalks. The flower-heads are smaller than those of the *P. Uvedalia*, and have acute involucral scales. The rays are of a pale, sulphur-yellow color, and are not longer than the involucre, they are three-toothed at the apex, the middle tooth being longer than the others. The two plants we have just described, are the only indigenous species of Polymnia, and, together with a few South American species, constitute the genus.

History.—Polymnia Uvedalia was introduced as a medicine about 1874 by Dr. J. W. Pruitt, the root being the part employed. This, when dry, is from six to twelve inches in length, and from a quarter of an inch to half an inch in diameter at the base of the plant. It extends downward into the ground, and running parallel with it several small roots springing from the base of the plant are often observed. The shape is somewhat like that of dandelion, but longer, not so tapering, and more flattened from the effect of drying. Toward the lower end it often divides into several fleshy rootlets, and secondary roots frequently spring from the main root. The outer surface is of a leather-color, and very much wrinkled longitudinally. Internally, it is white, or of a greenish cast, and soft, with the exception of a few woody fibers near the bark. It contains a large amount of resin, and exhales an unpleasant, animal-like odor when broken. There is no published analysis of the

plant. Alcohol extracts from the root all its medicinal principles, the extractive matter mainly consisting of glucose in considerable proportion; a form of tannin which precipitates ferrous sulphate, black; an odorous principle, soluble in water and alcohol; and a mixture of two resins, which is present in greater amount than any other of its characteristic constituents; this resinous compound is heavier than water, and lighter than chloroform, is of a brownish-yellow color, soft and sticky at ordinary temperatures, and possesses the odor of the root. It dissolves completely in chloroform, ether, and alcohol, imperfectly in benzine, which separates it into:—1st. A dark-brown, hard resin, of an acrid taste, which remains undissolved; this is insoluble in carbon disulphide, but freely dissolves in chloroform, ether, and alcohol. 2nd. A light-straw colored, balsam-like, resinous body, rather thicker than Canada balsam, which it otherwise very nearly resembles, and which dissolves quickly in ether, alcohol, benzine, chloroform, and carbon disulphide, is heavier than water, ether, alcohol, or benzine, and lighter than chloroform and carbon disulphide; it has the odor of polymnia root, and likewise an acrid taste.

Undoubtedly, polymnia depends upon these resinous bodies for its medicinal virtues. The aqueous solution of the evaporated tincture yields a precipitate with phospho-molybdate of ammonium, but not with other alkaloidal re-agents, and after precipitation of the tannin with either ferrous sulphate or gelatin, the filtrates give negative results with the phospho-molybdate of ammonium. Polymnia Uvedalia is used in medicine in form of tincture and ointment.

OINTMENT OF POLYMNIA.—Take of fresh Polymnia root eight troy ounces; lard or mutton-suet sixteen troy ounces; cut the root into small pieces, and, having added the lard, heat the mixture until water ceases to evaporate, and then strain while hot. The ointment is of a light-greenish color, and possesses the disagreeable odor of the root.—L.

Properties and Uses.—Polymnia was introduced to the medical profession, in 1870, by Dr. J. W. Pruitt, although it had several years previously been highly lauded, under the name of *bear's foot*, as a remedy in rheumatism. Dr. P. recommended it in the form of ointment, as a local application in mammary and other glandular tumors or abscesses, in splenic enlargement, and, indeed, in all painful swellings and local inflammations. Subsequently, he employed a tincture of it internally, in connection with its external use, and found its efficacy to be thereby augmented. The tincture alone, was likewise found efficient in the treatment of chronic intermittent fever, ozœna, scrofulous ophthalmia, and similar affections. According to Dr. P. it may be considered a specific in splenic enlargement from malarial influence. Professor J. M. Scudder has used it with good effect in chronic gastritis, chronic hepatic enlargement, and in hypertrophy of the cervix uteri; according to him the indications for its use are full, flabby, sallow tissues, impaired circulation, atonic impairment of function, and glandular enlargement. The efficacy of this drug in the maladies named has been corroborated by many other practitioners who have tested it. White swelling is stated to have been cured by the use of this agent both internally and as a local application, but we know of no authentic cases. The ointment appears to be a stimulating discutient. The properties of the drug when taken internally, have not yet been satisfactorily determined. The

dose of the tincture is from ten to sixty minims, two or three times a day.—K.

PRUNUS LAURO-CERASUS.

Nat. Ord.—Rosaceæ. *Tribe.*—Pruneæ.

The leaves of Prunus Lauro-cerasus, *Linn.* (*Syn.*—Cerasus Lauro-cerasus, *Lois.*)

Common Name.—Cherry-laurel.

ILLUSTRATIONS.—*Bent. and Tri. Med. Plants*, Plate 98; *Woodville's Med. Bot.*, Plate 185; *Artus' Hand Atlas*, Vol. I, p. 205.

Description.—Cherry-laurel is a small evergreen tree, native of Asia Minor, and often cultivated as an ornamental shrub in the Southern part of Europe. The *flowers* are small, white, and disposed in axillary racemes, which are shorter than the leaves. The *fruit* is an ovate, acute, purple drupe, with a globular stone. The *leaves* are very thick and leathery, about six inches in length, and one-third as broad, tapering at the apex to a sharp point, and at the base to a short leaf-stalk. The margin is denticulated with sharp, appressed, rather distant, serrate teeth. The upper surface of the leaf is of a bright-shining green color; the lower, pale and dull. The tree belongs to the section Cerasus (*Juss.*), which, by many botanists, is considered distinct from Prunus, chiefly on account of the globular fruit-stone.

History.—The leaves are employed in medicine. When fresh and bruised, they evolve hydrocyanic acid, but the unbroken fresh leaf is odorless. We may conclude that this acid is a *product* of the natural constituents of the leaves of cherry-laurel, instead of an educt from the leaves, and Wittstein has said that "hydrocyanic acid probably does not exist, as such, in the living vegetable organism." If the perfect leaves are dried and then powdered they do not give rise to hydrocyanic acid, but the addition of a little water at once develops the acid (*Hanbury*). At a meeting of the Pharmaceutical Society of Paris, December 6th, 1871, Mr. Marais stated that a temperature of −22° C. (7°.6 F.) applied to the leaves and twigs prevented subsequent formation of hydrocyanic acid, although other volatile products were produced. In 1847, Mr. Maher called attention to the fact that cherry-laurel leaves bruised and rubbed within a mortar or other vessel which was contaminated with the odor of substances such as, oil of cloves, cod-liver oil, balsam copaiba, etc., completely removed the odor. It is necessary, however, that all grease or resin be first removed by means of some alkali, or by alcohol. This property is also possessed by fresh peach leaves, and by bitter, as well as sweet, almonds.

The leaves of the Cherry Laurel have been analyzed several times, the most interesting constituent being *amygdalin*,[1] which is present in both the leaves and seed. From the leaves it is obtained in an amorphous form, and from the seed in crystals (*Wittstein*). Amygdalin has the composition $C_{20}H_{27}NO_{11}$, and decomposes under the influence of

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[1] Lehmann states that cherry-laurel contains a principle which differs from the amygdalin of the almond, and proposes for it the name *Laurocerasin*. This statement is accepted by *Pharmacographia*, and the molecule of laurocerasin ($C_{40}H_{67}NO_{30}$) is considered as composed of amygdalin ($C_{20}H_{27}NO_{11}$), amygdalic acid ($C_{20}H_{26}O_2$), and water ($7H_2O$).—L.

emulsin and moisture into oil of bitter almonds,[1] grape-sugar, and hydrocyanic acid. The act of bruising the leaves and distilling them in contact with water produces an oil (identical with bitter almond oil), and a little hydrocyanic acid, which substances constitute the medicinal agents of

AQUA LAUROCERASI, *Br.* (*Cherry-laurel Water*), prepared as follows, according to the *British Pharmacopœia:*

"Take of fresh leaves of cherry-laurel, one pound; water, two and a half pints (fifty ounces); chop the leaves, crush them in a mortar, and macerate them in the water for twenty-four hours; then distil one pint (twenty fluidounces) of liquid; shake the product, filter through paper, and preserve it in a stoppered bottle."—*Br.*

The French Codex employs cherry-laurel leaves ten grammes, water forty grammes, and by a moderate fire distils until fifteen grammes have passed over. The proportion of hydrocyanic acid contained in the cherry-laurel water is determined by means of a titrated solution of cupric sulphate, containing twenty-three grammes .09 of this salt, in crystals, to one thousand cubic centimetres of distilled water. The process is as follows: A flat-bottomed glass beaker is placed upon a sheet of white paper, and ten cubic centimetres of cherry-laurel water, with one cubic centimetre of aqua ammonia, are poured into it. The titrated cupric solution is placed into a burette divided into tenths of a cubic centimetre, from which it is gradually dropped into the liquid in the beaker, and, as soon as complete decolorization ensues, the number of divisions read upon the burette of the cupric fluid employed, will give exactly, in milligrammes, the proportion of hydrocyanic acid contained in ten grammes of the cherry-laurel water experimented with.

In this country, cherry-laurel water is often substituted by oil of bitter almond water; as that which is imported is quite variable in strength.—L.

Properties and Uses.—This water is employed in the same conditions and maladies as those in which hydrocyanic acid is indicated, in doses of from five to thirty minims, administered with prudence and caution; but on account of its uncertain strength it is rarely used in this country, bitter almond water being preferred, as it can readily be prepared as wanted for use. It may be made by rubbing together bitter almond oil four minims, with carbonate of magnesia fifteen minims, then adding, while continuing the trituration, distilled water eight fluidounces; when all are well rubbed together, filter, and preserve in close stoppered bottles. The dose is from one to three fluidrachms.—K.

PSORALEA.

Nat. Ord.—Leguminosæ. *Sub. Ord.*—Papilionaceæ. *Tribe.*—Galegeæ.

The root and leaves of Psoralea melilotoides, *Mich'x.*

Description.—The genus Psoralea comprises an extensive family of plants, mostly found in America, and in the neighborhood of the Cape of Good Hope. It consists, generally, of glandular-dotted herbs, with from three to five foliate *leaves*, and short, thick, indehiscent, one-seeded

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[1] In 1875, Mr. W. A. Tilden examined two and a half ounces of the oil that arose upon the surface of cherry-laurel water, and concluded that it consisted chiefly of bitter almond oil, accompanied with less than two per cent. of hydrocyanic acid, a small portion of another volatile oil, and traces of an odorous resin.—L.

legumes. The *flowers*, which are white or blue, are disposed, in all our indigenous species, in axillary spikes or racemes. The tubular *calyx* is five-parted, with the lowest lobe longest.

PSORALEA MELILOTOIDES (*Mich'x.*) (*P. eglandulosa*, *Ell.*) is the most common native species, found in open woods from Ohio and Kentucky, southward. The plant is pubescent and nearly glandless. The pale-blue *flowers* are borne on peduncles about four inches long. The *leaves* are trifoliate, with entire lanceolate leaflets.

PSORALEA ESCULENTA (*Pursh*), is indigenous to the elevated plains of the North West. It has five leaflets and capitate spikes of blue flowers. The root is bulbous, and is said to act as a diuretic, although, when boiled, it is used as food by the natives.

Under the name, *Jesuit's tea*, the leaves of a Chilian species, *Psoralea glandulosa*, are used as a substitute for Chinese tea. Lenoble[1] obtained from this latter species, tannin, volatile oil, other constituents of plants, and a white crystalline substance, which he named *psoralein*, and which, according to the above authority, is soluble in water, alcohol, and ether, and yields ammonia as a product of destructive decomposition by heat.—L.

Properties and Uses.—The root and leaves of these plants appear to possess the properties of a mild, stimulating, bitter tonic, and have been advantageously employed in cases of languor or feebleness from mental or physical exertion, in certain forms of chronic dyspepsia, to relieve anorexia, and as a stimulating tonic in strumous affections of the mesentery accompanied with diarrhea, tumid abdomen, etc. The P. melilotoides is the plant employed in this country, in infusion, or made into a tincture.—K.

RHAMNUS PURSHIANA.

Nat Ord.—Rhamneæ. *Tribe.*—Rhamneæ.

The bark of Rhamnus Purshiana, *D. C.* (*Syn.*—R. Alnifolius, *Pursh.* Frangula Purshiana, *Cooper.*)

Common Name.—Chittem Bark.

ILLUSTRATION.—*Hook. Flora Bor. Am.*, Vol. I, Plate 43.

Description.—This is a small tree, found in the Rocky Mountains, and westwardly to the Pacific Ocean, and extending north into British America. According to Mr. Jas. G. Steele, the country producing the tree extends over one thousand miles in length. The *branches* are round and pubescent. The *leaves* are from three to five inches long, about one-half as broad, and are borne on leaf-stalks nearly an inch in length. When young, they are covered with a dense pubescence on the under surface, but become glabrous and bright-green when old. In outline they are broadly elliptical, obtuse, and entire at the base, and generally with a blunt, acute apex. The margin of the leaf is regularly dentate, with numerous small, serrate teeth, except at the base. The lateral veins are many, sub-parallel, prominent underneath, and proceed from the mid-rib at an acute angle. The leaves closely resemble, but are not so slender as, those of the Alder-buckthorn of our Southern States (Frangula Caroliniana, *Gray*). The *flowers* are small, white, and appear after the leaves have matured; they are borne in close, umbellar

[1] *Journ. de Pharm.*, Sept., 1850.

clusters, on pubescent peduncles, slightly longer than the leaf-stalks. The pedicels are short, about a quarter of an inch in length when in flower, but, in fruit, elongate to an inch or more. The *calyx* is small, five-cleft, and pubescent on the outer surface. The *petals* are five, minute, white, shorter than the calyx-lobes, and two-cleft at the apex. The *stamens* are five, opposite, and embraced by the concave petals. The *pistil*, which is much shorter than the calyx-tube, consists of a free, three-celled and three-ovuled ovary, a short style, and a three-lobed stigma. The *fruit* is a small black drupe, obtusely three-angled, about the size of a large pea, and contains three black, shining seeds. The genus Rhamnus is represented by six native species, and all excepting R. lanceolata (*Pursh.*) and R. alnifolia (*L'Her.*), are found on the Pacific coast. A few of the Western species have evergreen coriaceous leaves.

History.—The bark is the part used in medicine, and has long been known in domestic practice among Western people, as a mild cathartic. It is found in the market, in curved pieces from a few inches to two feet in length, and from one-sixteenth of an inch to the eighth of an inch in thickness. Externally, it is gray; internally, it is yellowish, and the inner surface ranges in color from that of a light-yellow to that of leather. It imparts an insipid, sweetish, slightly astringent taste when chewed, scarcely marked by any prominent characteristic. Professor Prescott, of Ann Arbor, Mich., made a careful analysis (1879), the result of which is practically as follows: In structure the bark consists of three layers. The outer bark or epidermis is corky; the middle consists of parenchymatous cells filled with starch grains, a few cubical crystals, and occasional clusters of thick-walled yellow cells. The inner bark, principally consists of yellow medullary rays, separated by bast parenchyma, through which occasional yellow bast fibers are found, and which are often surrounded by small cubical crystals. The inner bark, and portions of the middle bark, are turned cherry-red by solution of potassium hydrate. The entire bark yields: 1st. A *brown, resinous substance*, bitter to the taste, soluble in alcohol, chloroform, benzol, and carbon disulphide; insoluble in ether; slightly soluble in water. Solution of caustic alkalies dissolve it with purple-red color, from which solution acids precipitate it. Concentrated sulphuric acid colors it blood-red. 2nd. A *red resin*, insoluble in water; slightly soluble in ether, chloroform, and carbon disulphide; soluble in alcohol, and in caustic alkali solution, with the production of a brown color in the latter case. Sulphuric acid deepens the color to brownish-red. 3d. A *light-yellow resin*; neutral, tasteless, insoluble in water, soluble in hot alcohol, chloroform, and carbon disulphide.

In addition, Mr. Prescott obtained a tannic acid, oxalic acid, malic acid, a yellow fixed oil, volatile oil, wax, starch, and a neutral crystallizable body. This latter substance separated, from solution in absolute alcohol, in the form of white double pyramids, which were almost insoluble in ether, chloroform and benzol. They melt and sublime, unchanged, at a temperature little above the heat of a water-bath, condensing into crystalline form. Professor Prescott sums up his investigations by stating that the chemical constituents present a great similarity to those of *Rhamnus frangula*, though not identical.—L.

Properties and Uses.—This is one of the many new medicines recently presented to the medical world, under somewhat equivocal circumstances. It has been highly recommended as a certain remedy in cases of habitual constipation, and in some forms of indigestion. If further trial of it will sustain these assertions, it will, undoubtedly, become a valuable

addition to our list of therapeutical agents. It is commonly prepared in the form of a fluid extract, the dose of which is from ten to sixty minims, repeated, as required, two or three times a day.—K.

RHUS AROMATICA.

Nat. Ord.—Anacardiaceæ. *Tribe.*—Anacardiaceæ.

The bark of the root of Rhus aromatica, *Ait.*

Common Names.—Fragrant Sumach, Sweet Sumach.

ILLUSTRATION.—*Gray's Genera*, Plate 160.

Description.—This is a small, bushy shrub, growing from two to six feet high, and found in clumps throughout sections of the Eastern United States, in rocky situations. The *leaves* are trifoliate, and on stalks about an inch in length. The three leaflets are sessile, and covered with a short velvety pubescence when young. The terminal leaflet is considerably larger than the lateral leaflets, from an inch to two inches in length, and about two-thirds as wide. They are entire and tapering at the base, acute, and have eight or ten crenate teeth at the apex. The *flowers* are small, greenish-yellow, and open in April before the leaves; they are in stalked, spiked, ament-like clusters, and, before flowering, have the appearance of an unexpanded catkin. The *sepals*, *petals*, and *stamens* are in fives, and the pistil is a one-ovuled ovary, with three short styles. The *fruit* is a small red drupe, about the size of a pea, covered with dense white pubescence. They are produced in clusters of about a dozen, and are on stalks about half an inch long; each one contains a single flattened seed. A variety (var. trilobiate, *Gray*) with small, smooth leaflets, generally less than an inch in length, is common throughout Texas and the Western States and Territories.

History.—The part employed in medicine is the root, or the bark of the root. It has attained some little local reputation heretofore, but was unknown to the medical profession until introduced by Dr. McClanahan, in 1879. When dry, the root is from one-fourth of an inch to an inch in diameter, and appears in the market in pieces of from six inches to two feet in length. The bark is of a dark rusty-brown color externally, and a pink or walnut color below the cork. It is about one-eighth of an inch in thickness, and throughout the inner bark of a prime article are little cavities containing a transparent balsam, somewhat resembling balsam of fir. The wood is white or yellowish. When fresh, the wounded bark exudes a turpentine-like balsam, or solution of a resin in some volatile oil, which dries to a glossy tear or layer. The bark is astringent; but, undoubtedly, the turpentine-like balsam likewise possesses considerable medicinal value. Alcohol extracts this substance, and the addition of water to the tincture, produces a milkiness. In making the tincture of either the fresh or dry bark, alcohol alone should be used, and any addition of water is objectionable.

Properties and Uses.—This exceedingly valuable addition to our Materia Medica, was introduced by J. T. McClanahan, M. D., Booneville, Mo.[1] At first, the use of this remedy was confined to the treatment of

[1] *Eclectic Med. Journal*, 1879, p. 317.

diabetes, and other excessive discharges from the kidneys and the bladder, as well as to cases of incipient albuminaria. More recently, it has been employed by numerous practitioners, who, in addition to the above-named maladies, have found it advantageous in urethral irritations; hemorrhage from stomach, lungs, kidneys, bladder, or uterus; uterine leucorrhea; cholera infantum; diarrhea; dysentery; chronic laryngitis; chronic bronchitis; and especially useful in the enuresis of children and of aged persons. We are aware of the value of this agent in several of the diseases referred to, and should subsequent experiments prove its efficacy in the earlier stages of albuminaria, it will rank among the first therapeutical remedies of our Materias. It is now preferred in the form of fluid extract, of which the dose varies from five to sixty minims, repeated every three or four hours; it may be taken in water, in glycerin and water, and in solution of pure gelatin, or in syrup, when these vehicles are not contra-indicated

Since writing the above, we have received a letter from A. G. Springsteen, M. D., of Cleveland, Ohio, in which he refers to a patient suffering, for several years, from catarrh of the bladder, and hypertrophy of the prostate, with excruciating pain during micturition, necessitating the continued use of the soft catheter, the introduction of which invariably proved painful. After exhausting the employment of all recognized remedies for the patient's condition, together with the use of the water at the Hot Springs of Arkansas, etc., without the least benefit, as a *dernier ressort*, he placed the patient upon teaspoonful doses, three or four times daily, of the fluid extract of Rhus aromatica; in three weeks' time the symptoms were all removed, and the prostate so far reduced that the use of the soft catheter became unnecessary. The patient is sixty-five years old, and at this time voids urine as freely and as painlessly as a boy of eighteen years.—K.

SABBATIA ELLIOTTII.

Nat. Ord.—Gentianaceæ. *Sub Ord.*—Gentianeæ.

The herb of Sabbatia Elliottii, *Steud.* (*Syn.*—S. paniculata, *Ell.*)

Common Name.—Quinine Flower.

Description.—This is an erect herb, about twelve inches in height, and is common to the pine barrens of the Southern United States. It does not, probably, occur farther north than the Carolinas. The *stem* is smooth, slender, round, with but few leaves, and alternately branched. The *leaves* are small, opposite, entire, without leaf-stalks, and from half an inch to an inch in length; the upper leaves are very narrow and linear, the lower are broader; they are attached at nearly a right angle to the stem. The *flowers* are white, nearly an inch broad, and quite showy; they are borne on slender peduncles, and appear late in the summer. The *calyx* has a short tube, and five linear lobes about one-third the length of the corolla segments. The *corolla* is flat, rotate, and has five obtuse lobes. The *stamens* are five, and attached to the corolla-tube. The *fruit* is a dry, one-celled capsule, opening by two valves, and containing many small seeds.

History.—This plant was noticed in the *Am. Journ. Pharm.*, 1876, by Dr. Palmer, of Monticello, Florida. It had been previously used in domestic practice, and during the civil war. Some little demand was

created after the publication of Dr. Palmer's article, but the remedy has since almost fallen into disuse.—L.

Properties and Uses.—This plant, as the name "quinine flower" would show, was supposed to possess tonic and antiperiodic properties, somewhat analogous to those of quinia. It was lauded as a remedy for all malarial fevers, as a tonic during convalescence from exhausting diseases, and in various forms of debility. It is seldom, if ever, employed at the present day. The dose of the fluid extract is from five to sixty minims, repeated every one, two, three, or four hours, according to circumstances.—K.

SCUTELLARIA.

Nat. Ord.—Labiatæ. *Tribe.*—Scutellarineæ.

The mature leaves and flowering tops of Scutellaria lateriflora, *Linn.*

Common Name.—Scullcap.

ILLUSTRATIONS.—*Strong's Am. Flora*, opposite page 100; our *Fig.* 7.

Fig. 7.

SCUTELLARIA LATERIFLORA, *Linn.* (True SCULLCAP.)—Natural Size.

We introduce this plant, accompanied with illustrations, to overcome the confusion that has existed in commercial circles regarding the plant ordinarily sold as scullcap. The officinal species is the Scutellaria

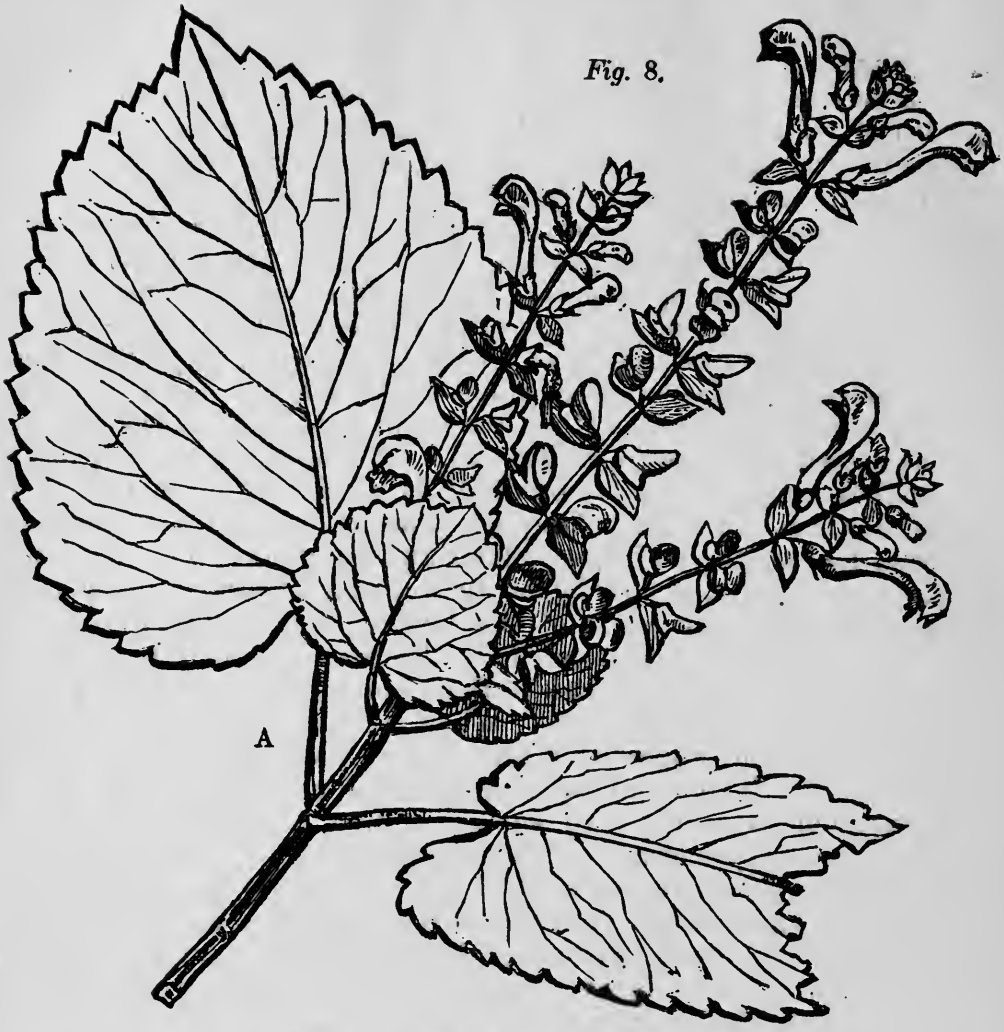
lateriflora, but the larger part of the drug sold upon the market under that name is derived from two other species of Scutellaria.—K. & L.

Description.—The genus Scutellaria is well characterized by the calyx, which in all the species consists of two round lips closed in fruit, the upper lip of which has a helmet-shape appendage, giving to it the appearance of a mask or cap; hence the common name, *scullcap.*

SCUTELLARIA LATERIFLORA (*Linn.*), the officinal scullcap, is the most widely-distributed of the species. It is common in every section of the United States, and is found growing in damp places on the banks of streams, and in similar situations. Inasmuch as this is the proper scullcap to use in medicine, and as it is often confounded with other species, we will give a close description of the plant (see *Fig.* 7). The *stem* is slender, herbaceous, four-angled, much branched, and from one to two feet high; it is smooth, green when the plant grows in shady situations, but turns brown on exposure to the sun. The *leaves* are small, from one to two inches long, and about one-half as wide, ovate, rounded at the base, and acute at the apex. They are smooth, crenate, and are borne on opposite leaf-stalks, which are about an inch long. The *flowers* appear late in summer, and are borne in numerous, slender, simple, one-sided racemes, from the axils of the leaves; they are small, opposite, and have short pedicels, sub-tended at the base by small bracts. The *calyx* is about the length of the pedicel, and has the peculiar helmet-shape characteristic of the genus. When the fruit is mature, the calyx splits to the base, the upper lip falling away, the lower one remaining. The *corolla* is small, blue, about a quarter of an inch long; it has a slender, exserted tube, and two sub-equal lips, the upper of which is arched, the lower, spreading. The *stamens* are four, and included in the corolla. The *fruit* consists of four small nutlets.

SCUTELLARIA VERSICOLOR (*Nutt.*), and *Scutellaria canescens* (*Nutt.*), are the species generally collected by herbalists, and substituted for Scutellaria lateriflora. We present an engraving of Scutellaria versicolor, and both this and S. canescens can readily be distinguished from officinal scullcap, by their being much more robust, having thicker stems, and growing from two to four feet high, The flowers are large in both, being an inch long; and instead of being borne in very slender, lateral racemes, as with S. lateriflora, they are borne in a single, large, terminal, branched raceme. The leaves are also much larger than those of S. lateriflora, being from two to four inches long, and nearly as broad. They are cordate at the base, and acute at the apex. The leaves of S. versicolor are thin, softly pubescent, and of a bright-green color; those of S. canescens are thick in texture, light green, and often variegated with a purple line around the margin.—L.

Fig. 8.



SCUTELLARIA VERSICOLOR, *Nutt.*—Natural Size.

Properties and Uses.—See *King's American Dispensatory*, 8th edition, p. 758.—K.

SEDUM ACRE.

Nat. Ord.—Crassulaceæ.

The plant of Sedum acre, *Linn.*

Common Names.—Mossy Stonecrop, Biting Stonecrop, Small Houseleek.

Description.—This is a low, moss-like, fleshy plant, native of Europe, but very common in cultivation, and sometimes naturalized in this country. It has a spreading, thick, green *stem*, from one to three inches high. The *leaves* are fleshy, small, sessile, erect, and numerous, almost entirely covering the stems. The *flowers* are bright-yellow, sessile, and arranged in three-parted, terminal cymes. The *sepals*, *petals*, and *carpels*, are in fives in the central flowers of the cyme, and in fours in the others. The *stamens* are in number double the other parts of the flower. There are about half a dozen native species of Sedum, mostly found in dense patches, in rocky woods, throughout the United States. They all have white or light-purple flowers, which appear in June or July. *Sedum ternatum* is the most common species in Ohio and the neighboring States.

History.—*Sedum acre* was analyzed by Mylius, who found it to contain wax, chlorophyll, acrid resins, mucilage, sugar, an alkaloid, and other substances common to plants. He describes the alkaloid as uncrystallizable, acrid to the taste, not volatile, soluble in ether, alcohol, chloroform, and water; it unites with acids to form soluble salts. The hydrochlorate, in solution, is precipitated by excess of ammonia, or the hydrate, or carbonate of potassium. *Rutin* or *Rutic acid* is also present, according to the aforementioned authority.—L.

Properties and Uses.—Sedum acre has little or no odor, and its taste, at first herbaceous, is followed by a persistent acrid pungency. The leaves pounded and applied to the surface of the body will occasion a troublesome vesication. Taken internally, the plant, or its expressed juice, has an emeto-cathartic action, and was recommended in scrofulous affections, malarial fevers, and even in epilepsy; however, it is rarely employed at the present day, except occasionally, as a local application to glandular enlargements, to scrofulous ulcers, and to some chronic cutaneous maladies—the fresh leaves only, bruised, being used—thus applied to warts, corns, or similar growths, it is said to ultimately effect their removal. Internally, the expressed juice has been used in doses of from one to two fluidrachms, taken in beer or wine.—K.

SODII BENZOAS.

Benzoate of Sodium.

Formula, $NaC_7H_5O_2$; molecular weight, 139.20.

Preparation.—Take of benzoic acid (made from gum benzoin) eight parts; bicarbonate of sodium, five and a half parts; distilled water, six parts. Mix the benzoic acid with the distilled water, in a capacious porcelain capsule; raise the temperature, by means of a water-bath, to 150° F.; then add the bicarbonate of sodium, stirring constantly with a wooden or porcelain spatula. When a clear solution is produced, and effervescence ceases, filter; then evaporate the filtrate upon a water-bath, with constant stirring, until a dry salt is obtained. The yield will be twelve parts.

History.—Benzoate of sodium came into use during the latter part of 1879. The calculated proportion of bicarbonate of sodium to benzoic acid is about eighty-four parts of the former to one hundred and twenty-two parts of the latter. Benzoate of sodium is a white powder, odorless, and permanent. It dissolves freely in water, but is insoluble in ether and chloroform, and almost, if not absolutely, insoluble, in stronger alcohol. The solution in water is decomposed by the mineral acids, benzoic acid being precipitated in the form of crystalline flakes. This precipitate, when washed with a little water, pressed between folds of blotting paper and dried, should dissolve completely in ether, chloroform or benzine. It should not have an odor like urine, and, if such is the case, benzoic acid prepared from hippuric acid was employed in making the benzoate of sodium.—L.

Properties and Uses—Benzoate of sodium has recently been introduced into therapeutics as an antipyretic and an antiseptic. It is said to reduce fever less rapidly than quinia, and more permanently. It has been employed not only as a prophylactic against diphtheria, but likewise as a curative agent. In Germany, many cases of this disease have been recorded, in which it proved successful. Klebs and Hoffman

have derived great benefit from its administration in erysipelas, in albuminaria, and in some cases of acute rheumatism. Petersen succeeded in recovering a patient from an almost hopeless puerperal fever, giving it in daily doses of one hundred and fifty-four grains in solution; he advises its further trial. More recently it has been recommended in all malarial and infectious fevers. Dr. J. B. Berkhart reports the cure of a case of syphilitic lupus from its use. From the statements made by many physicians who have experimented with this agent, it appears to have valuable therapeutical virtues; and, if the statements referred to are hereafter sustained by the testimony of other medical men testing it, it will become an important remedy. The salt prepared with the natural benzoic acid should only be employed. Its dose varies from ten to twenty grains in solution, repeated every one, two, or four hours; large doses, even when continued for a long time, give rise to no unpleasant after-effects. A five per cent. solution of this salt, inhaled into the lungs, has been advised in the treatment of phthisis (*Rokistansky*); but further trials are necessary before sufficient confidence can be placed in its inhalation as a remedial means in this disease.—K.

SPERGULARIA RUBRA.

Nat. Ord.—Caryophylleæ. *Tribe.*—Alsineæ.

The roots and plant of Spergularia rubra, *Presl.* (*Syn.*—Arenaria rubra, *Linn.* Lepigonum rubrum, *Fries.* Spergularia rubra, var. campestris, *Gray's Manual.*)

Common Names.—Sand-spurrey; Red-sandwort; Spurrey-sandwort.

Description.—The Spergularia rubra is an inconspicuous annual weed, found both in the United States and in Europe, in dry, sandy situations, more commonly near the coast, but not in brackish places. The *stems* are many, and from the same root, matted, much branched, from six to twelve inches in length, and lying prostrate on the sand. The *leaves* are linear, fleshy, and about an inch long; they are opposite, and have, generally, smaller leaves clustered in their axils; they are surrounded, at the base, by two dry, triangular, scale-like stipules. The *flowers* are small, numerous, axillary, and appear throughout the summer; they are borne on slender peduncles, about half an inch long, which are reflexed in fruit. The *calyx* has five scarious-edged sepals. The *corolla* has five rose-colored, entire petals, about the length of the sepals. The *fruit* is a dry, many-seeded pod, opening by three valves.

S. salina (*Presl.*) and S. media (*Presl.*), the only other native species of Spergularia, are found in brackish sandy places; they closely resemble the S. rubra, and have, probably, the same properties. Spergula arvensis (*Linn.*), a naturalized weed, has a similar appearance to Spergularia rubra, but can be distinguished by having whorled leaves.

Spergularia rubra has of late been recommended as a remedy, and, it is said, has long been employed in Sicily. It was analyzed by M. Legout, of Algiers (where the plant is very abundant); by Dr. Jacqueme, of Marseilles; and by Vigier, of Paris. It yielded to water one-fourth its weight of extract (when dried). This was deliquescent, and yielded from three to four parts of nitrogen; it left, upon calcination, an ash of which about one-fourth the weight was soluble in water, and consisted, mainly, of salts (carbonates and chlorides) of potassium and

sodium, besides which, insoluble silica and alumina were found.[1] Ether, alcohol, and chloroform extracted from the plant, in addition, an aromatic resin; and when the plant was distilled with water, ammonia was evolved, supposed by the investigators to exist in the plant as *free* ammonia, for muriate of ammonium was obtained from the fresh plant by means of dilute hydrochloric acid.—L.

Properties and Uses.—This plant was employed in Sicily and neighboring countries as a secret remedy, for many years, in the form of a tisane, and sold at exorbitant prices. A specimen of the plant having been obtained by an individual who had been benefited by the use of the tisane, was analyzed by M. Legout, a pharmacist, and its therapeutic action tested in some of the Paris hospitals, by M. Bertherand, and others. It has been found very efficacious in the treatment of gravel, having been experimented with, in Europe, in numerous cases. The best preparation for administration is a decoction; which exerts a stimulating action upon the circulation and the secretions, especially those of the urinary organs; the discharge of gravel through the ureters is facilitated under its use, and nephritic colic, when present, is promptly relieved. Five drachms of the plant to a pint of water is the medium dose, to be taken daily; it may be sweetened, if desired. Pills or syrup may be substituted for the decoction, in doses of fifteen grains every one, two, or three hours. M. Vigier advises the following powder as preferable to the other preparations: Take of aqueous extract of spergularia rubra one hundred and fifty-four grains, powdered white sugar (free from glucose) four hundred and sixty-one grains; mix thoroughly together, and divide into five equal papers or packets; one of these to be added to a quart of water, and to be drank during the day. A similar quantity of extract in a fluidrachm and a half of pure glycerin and three fluidounces of distilled water, gives a solution that keeps well, and of which the dose is a teaspoonful, to be repeated five times a day—equivalent to a quart of the decoction. With regard to this plant, as a therapeutic agent, a writer observes: "We can understand that a plant so rich in constituent elements, in chloride of potassium and sodium, in alkalies, and in aromatic principles, must have a powerful action upon the animal economy. Combined with the albuminous juices of the vegetable, the chlorides must act otherwise than in the free state."—K.

SPILANTHES.

Nat Ord.—Compositæ. *Tribe.*—Senecionideæ.

The herb and flower-heads of Spilanthes oleracea, *Jacq.*

Common Name.—Para-cress.

Description.—The genus *Spilanthes* is a tropical family of, mostly, annual weeds, with opposite leaves and terminal, stalked, flower-heads. It is closely allied to Bidens, differing, chiefly, in the achenia, which are plano-convex, with a membranous winged margin. The pappus consists of two short awns. The recepticle is conical and paleaceous.

SPILANTHES OLERACEA is a native of South America, and is often cultivated in tropical countries, where it is used as a salad. It is known under the name *Para-cress.* It is a small, erect herb, of rapid growth, and has cordate stalked *leaves.* The *flowers* are small, yellow, and solitary, on

[1] It is likely that the alumina was derived from soil attached to the plant.—L.

terminal peduncles. The Chinese derive a blue coloring matter from Spilanthes tinctoria (*Loureire*) similar to indigo.

History.—Spilanthes oleracea has an acrid, aromatic taste, resembling, but more powerful than, peppermint. Analyzed about fifty years ago, with the exception of an odorous volatile oil, nothing was found beyond the organic substances common to most plants. When chewed it occasions a copious flow of saliva.—L.

Properties and Uses—Spilanthes is an acrid, aromatic sialagogue, and which, like the galanga root, has been recommended in flatulence, to improve the appetite and digestive functions, and to overcome nausea and vomiting. The natives of the countries to which it is indigenous, are stated to have employed it advantageously in gouty and rheumatic affections, in uric-acid gravel, in dropsical effusions, and even to remove intestinal worms. A tincture of it on cotton, and introduced into the cavity of a decayed tooth, will, it has been remarked, promptly remove toothache. It is not employed in this country.—K.

SULPHOCARBOLATES.

SULPHOPHENATES.

History.—Sulphocarbolates are salts prepared respectively from *ortho–* and *para–* phenolsulphonic acids. When concentrated sulphuric acid and carbolic acid are mixed together in equal proportions, and the mixture is digested at from 40° C. (104° F.) to 50° C. (122° F.), the former (ortho–) acid, is mainly formed. When the temperature is increased to 149° C. (300° F.), this acid changes to the *para–* phenolsulphonic acid. Neither acid is known in an absolute state. In commerce, distinctions are not made in the salts derived from the two, and, perhaps, their therapeutical actions are identical. The *para–* sulphocarbolates are very easily prepared, and consequently are found almost exclusively in the market. The composition of each of the two acids is, $C_6H_6SO_4$. Their salts are all soluble in water; generally soluble in hot alcohol; but insoluble in ether. Most of the ortho– salts are more soluble than the corresponding para– salts. Commercial sulphocarbolates are made very easily by mixing equal parts of sulphuric and carbolic acids, and heating the mixture to 149° C. (300° F.). The mixture, upon cooling, is diluted with water, neutralized with the necessary carbonate, and evaporated to crystallization. Adhering sulphates are removed by simply dissolving the salt in warm water, and then recrystallizing. This forms the *para–* sulphocarbolate, which crystallizes in nice large crystals. The process is much less tedious than that for the following or ortho– sulphocarbolates.—L.

CALCII SULPHOCARBOLAS.

SULPHOCARBOLATE OF CALCIUM.

Formula, $Ca2C_6H_5SO_4$; molecular weight, 385.18.

Preparation.—Melt sixteen troy ounces of carbolic acid, in a porcelain dish, and, with constant stirring, pour into it sixteen troy ounces of concentrated sulphuric acid, and then apply the heat of an expanded steam or water-bath for twenty-four hours. Dilute the mixture with eight pints of cold distilled water, and gradually stir into it powdered

carbonate of calcium, until effervescense ceases; then permit the mixture to stand for a few hours, filter, wash the precipitate with water, and evaporate the mixed filtrates to dryness over a water-bath. The product (about twenty troy ounces) will be impure sulphocarbolate of lime, usually of a pink color. To purify it, redissolve it in water, filter, and again evaporate to dryness.

When the sulphuric and carbolic acids are mixed, the result is a deep-pink colored liquid, or often brownish-red, from impurities in the latter acid. This coloring matter adheres most persistently to the salt. The yield is never as large as theory would indicate, mainly resulting from the fact that a certain part of both the sulphuric and carbolic acids remains free; for, when diluted to a certain extent, they do not unite, and it seems that the formation of the sulphocarbolic acid, at a certain point, completely retards the reaction, for this acid acts as a diluent in proportion to its bulk. Sulphocarbolic acid increases the solubility of carbolic acid in water, therefore, the subsequent addition of water does not separate an excess of carbolic acid by precipitating it from solution as might be supposed. To purify the salt, uncombined sulphuric acid is thrown out as sulphate of calcium, upon addition of of the carbonate of calcium, and the subsequent heat, evaporates the free carbolic acid. Sulphocarbolate of lime may be used to prepare the other sulphocarbolates. The more expensive barium carbonate may be substituted for calcium carbonate in the foregoing operation, and sulphocarbolate of barium be formed in like manner as the sulphocarbonate of lime. Neither sulphocarbolate of calcium nor sulphocarbolate of barium are used as medicines.—L.

SODII SULPHOCARBOLAS.

Sulphocarbolate of Sodium.

Formula, $NaC_6H_5SO_4 2H_2O$; molecular weight, 195.63.

Preparation.—Dissolve two parts of sulphocarbolate of calcium in four parts of distilled water, and stir into it solution of sulphate of sodium until in slight excess; rather more than one and a half parts of crystallized sulphate of sodium will be required. Permit the mixture to stand a few hours, then filter, and wash the precipitate with distilled water until the runnings are nearly tasteless. Evaporate the filtrate to dryness, on a steam or water-bath, and dissolve the residue in boiling alcohol (about ten parts), then filter, and place it in a cold situation to crystallize. In case a trace of sulphate of sodium is not objectionable, the crystallization from alcohol may be dispensed with. The aqueous solution should then be evaporated until a skim forms upon the surface, and then be allowed to crystallize.

As thus prepared, sulphocarbolate of sodium is in the form of small needle-like crystals, white, very soluble in water, less so in alcohol, and insoluble in ether. It does not form precipitates with barium chloride; if a small crystal be boiled with nitric acid, and the liquid be then neutralized with solution of caustic potassæ, a yellow color will result (carbazotate or picrate of potassium). This test is not distinctive as it applies to carbolic acid and carbolates as well as sulphocarbolates.—L.

Properties and Uses.—See *Zinci Sulphocarbolas.*

ZINCI SULPHOCARBOLAS.

SULPHOCARBOLATE OF ZINC.

Formula, $Zn2C_6H_5SO_4$; molecular weight, 410.18.

Preparation.—Sulphocarbolate of Zinc is made by exactly neutralizing a solution of sulphocarbolate of calcium with sulphate of zinc, filtering, and evaporating. In like manner, other sulphocarbolates may be prepared as desired. The zinc and sodium salts of sulphocarbolic acid only are in use.—L.

Properties and Uses.—Sulphocarbolate of soda is simply a disinfectant. At one period it was highly extolled as an efficacious internal remedy in scarlatina, diphtheria, typhoid fever, in septicemic diseases generally, and even in phthisis pulmonalis, but well conducted trials of it in these affections have not sustained such marvellous assertions. It has been found more useful as a local application, employed in aqueous solution in form of spray; used in this manner it has been sometimes beneficial in gangrenous conditions, and in the removal of the pseudomembranous exudations encountered in aphthæ, scarlatina, and diphtheria; and, in these cases, it owes its properties to the phenic acid present. Its dose internally is from five to twenty-five grains in solution.

Sulphophenate of zinc is rarely used internally. As a local application it has proven, in many instances, to be superior to the soda salt. It possesses both antiseptic and astringent properties, and is less irritating in its effects than phenic acid. As a spray or wash, it will be found useful in surgical dressings, in certain pseudomembranous exudations, in gangrenous conditions, and in chronic ophthalmia; in injection it will prove useful in chronic gonorrhea, leucorrhea, and gleet. As an astringent it may be advantageously substituted for sulphate of zinc in urethral injections, possessing all its benefits without any of its inconveniences. The strength of the solution in water, will vary from one to five parts of the salt to one hundred or more parts of water.—K.

SUMBUL.

Nat. Ord.—Umbelliferæ. *Tribe.*—Peucedaneæ.

The root of Euryangium Sumbul, *Kauffman.* . (*Syn.*—Ferula Sumbul, *Hook., fil.*)

Common Names.—Sumbul, Musk-root, Jatamansi.

ILLUSTRATIONS.—*Bot. Mag.* Plate 6196; *Tri.* and *Bent. Med. Plants*, Plate 131.

Description.—The plant that produces the sumbul-root of commerce, is an herbaceous perennial, with an erect milk-bearing *stem*, and is a native of Central Asia. The *leaves* are mostly radical, large, and ternately decompound, with the ultimate segments narrow and toothed. The upper stem leaves are reduced merely to the sheathing bases of the petioles. The *flowers* are small, yellow, and disposed in compound umbels. The terminal umbels are perfect, the lateral, only staminate. They have five stamens, five petals, and a two-carpeled pistil. The *fruit* consists of two dry, seed-like carpels, compressed laterally, and each carpel having three dorsal ribs, and two narrow lateral wings.

History.—For thirty years after sumbul (musk-root) had become an article of commerce, nothing was known concerning its botanical source.

In 1869, Kauffman, from plants collected in Russian Turkestan, and grown in the Moscow Botanic Garden, established it in a new genus, *Euryangium*, closely related to Ferula, and differing chiefly in the broader vittæ.[1] The plant has since, however, been ascribed to *Ferula* by Petournikoff, and by Hooker, fil., after an examination of the ripe fruit sent from Russia.

Euryangium sumbul, or musk-root of commerce, reaches our market through Russia. It occurs in pieces or sections, often branched, and from half an inch to four inches in thickness, the diameter of the root ranging from half an inch to three inches. It is brown externally, the bark, in some instances, scaling off in tough, paper-like pieces, resembling birch bark, and again adhering closely to the root. The lower part of the stem is frequently attached to the root, and usually, in such cases, it is broken into a fibrous mass. The cut parts of the roots are covered with a dirty resinous layer, which exuded while fresh. A fresh section of the root shows a very porous, spongy texture; in many cases the fibrous substances being saturated with resinous matter, especially near the bark. There is much difference in the color, some pieces being almost white internally; these we find to contain a comparatively small proportion of resin, and to be of light weight, when compared with the specimens of a brown color. This latter quality of the root is to be preferred, although it is customary, we believe, to select the former. Choice sumbul has a strong odor of musk, is resinous internally, and is aromatic and bitter to the taste. Its medicinal principles seem to be mostly extracted by strong alcohol, the addition of even a small amount of water being objectionable.

An examination of sumbul was made about 1843, by Reinsch, who found it to contain wax and a balsam; both are extracted from the root by ether. The balsam has a faint musky odor, strengthened by soaking in water; it dissolves in sulphuric acid, with the production of a blue color, and, it is said, when distilled in a retort, yields two oils—the first a clear yellow, followed by the second, of an emerald-green. When the root has been previously extracted by ether, alcohol dissolves from it an aromatic resin and a bitter substance, the latter being soluble in water. The root also contains Angelic acid (*Wittstein's Org. Const. of Plants*), and a volatile oil, the other constituents seeming to be unimportant.—L.

Properties and Uses.—Sumbul is a stimulant and tonic to the nervous system; it has been recommended in low typhous fevers, in gastric spasm, hysteria, delirium tremens, diarrhea, dysentery, leucorrhea, gleet, chlorosis, asthma, chronic bronchitis, and other maladies accompanied with an asthenic condition. In nervous diseases of a low, depressing character, it has been found very useful. Dr. Murawieff, a Russian physician, considers the balsamic resin as the active part, and has proposed its use, in the form of pills or tincture, in pulmonary maladies. The drug is seldom used in this country, but it certainly deserves further investigation. It is prepared in the form of fluid extract, the dose of which is from ten to sixty minims, every two, three, or four hours.—K.

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[1] *Treasury of Botany.*

TAXUS.

Nat. Ord.—Coniferæ. *Tribe.*—Taxineæ.

The leaves and fruit of Taxus baccata, *Linn.*

Common Name.—Yew tree.

ILLUSTRATION.—*Bent. and Tri. Med. Plants*, Plate 253.

Description.—The common yew is a large evergreen tree, native throughout Europe, and very commonly planted as an ornamental tree in church-yards, cemeteries, etc., especially in England. It is of very slow growth, and has a hard, close-grained wood that is much used by cabinet-makers. The *branches* are long and horizontal, the lowest ones proceeding from the trunk at only a few feet from the ground. The *bark* is of a dark-brown color, and does not split longitudinally, like the bark of most trees, but scales off in thin plates. The *flowers* appear in early spring, and the male and female are borne on separate trees. The male are in axillary aments, and consist, each, of a thickened axis, having anther-bearing bracts on the upper half, surrounded at the base by imbricated scales. The female flowers are, each, a single sessile, naked, ovule, without either style or stigma, surrounded at the base by a circular disk, which becomes fleshy in the fruit. The *fruit* is a single oval seed, covered, excepting at the apex, by a thick, fleshy, red cup, and resembles an abortive acorn surrounded by its cup. The cups of the yew fruit are sweetish, though unpleasant to the taste, often, however, being eaten by children. The *leaves* are very numerous, linear, about half an inch long, and one-twelfth of an inch wide, sharp, dark-green above, lighter beneath, alternate, and are curved outwardly and upwardly.

An American variety (var. Canadensis, *Gray*) of the Taxus baccata, is a small shrub found growing in shady, moist places in Canada and the northern parts of the United States.

History.—Excepting the pulp of the fruit, all parts of the yew tree are poisonous. Pliny, Dioscorides, and other ancient writers, mention the poisonous properties of the leaves and seed, and it has been recorded that wine, preserved in casks made of its wood, has occasioned the death of those who drank it. Strabon states that the Gauls used the juice of the leaves as a poison for their arrows. Recent observations have confirmed the statements as to its toxic character; and we frequently read of animals and birds that have been poisoned by the leaves and berries. It is likewise stated that the exhalation emanating from the tree may occasion vertigo, lethargy, and a kind of drunkenness · and that even death may ensue to those who carelessly sleep beneath its branches. Prof. Redwood read a paper before the Pharmaceutical Society of Great Britain (1877), citing the fatal result from drinking a decoction of the leaves.

Lucas and Mavine have discovered an alkaloid in it, *taxin*. It is yielded by both leaves and seeds, as an amorphous, white powder, bitter to the taste, soluble in alcohol and ether, nearly insoluble in water, but giving uncrystallizable solutions with dilute acids. It is precipitated from its solution by tannic acid, caustic alkalies, and tincture of iodine. Concentrated sulphuric acid produces a purple-red colored solution, that is decolorized by water. This alkaloid is not used in medicine, and, as far as we know, has not been examined as to any poisonous properties it may contain.—L.

Properties and Uses.—The symptoms occasioned by the juice or extract of the leaves, vary according to the quantity that has been taken. In large doses, there is pallor, vertigo, spasm, and symptoms of collapse, with gastric and enteritic irritation, enfeebled and deranged cardiac action, coma, and death. Not unfrequently, very large doses are followed by a prompt diminution of the vital forces, or by positive syncope, in either case speedily terminating in death, without any of the severe symptoms of irritation being manifested. Post-mortem investigations have found some indications of inflammation of the stomach and bowels, of active renal congestion, and of diminished heart-power, with a greater or lesser deprivation of the coagulable quality of the blood. The red berries are not injurious; Percy, in former times, prepared a jelly and a syrup from them, which he used in cough, chronic bronchitis, and to relieve the pain in calculous nephritis. The leaves have likewise been recommended in certain maladies, which it is unnecessary to name, as we have no satisfactory evidences of their efficacy. In cases of poisoning by the ingestion of this article, it should be promptly removed from the stomach by emesis, after which milk or other bland drinks may be administered, at the same time sustaining the strength, if necessary, by the prudent exhibition of stimulants.—K.

THALICTRUM.

Nat. Ord.—Ranunculaceæ. *Tribe.*—Anemoneæ.

The herb of Thalictrum Anemonoides, *Mich'x.* (*Syn.*—Anemone Thalictroides, *Linn.*)

Common Name.—Rue Anemone.

ILLUSTRATION.—*Bot. Mag.*, 866.

Description.—This is a little plant about six or eight inches high, common in open woods throughout the Middle and Eastern United States. The *root* consists of a cluster of oblong tubers, bearing a few radical biternate *leaves*, and a flowering stem. The cauline *leaves* are clustered in a whorl at the top of the stem, forming an involucre at the base of the flowers. The *flowers*, which are centrifugal in development, have from eight to ten colored sepals, varying in color from a pale-pink to a pure white. This pretty little plant is one of the earliest spring flowers, blooming in March and April. It has been the subject of considerable diversity of opinion among botanists, concerning its position in the Natural System, being intermediate in character between the two genera, Anemone and Thalictrum; with the flower of the former it has the fruit of the latter, and while the arrangement of the leaves is like that of the genus Anemone, their shape accords with that of the different species of Thalictrum. Linnæus, who was the first to give the plant a specific name, called it "*Anemone Thalictroides*," which name it retained until Michaux transfered it to the genus Thalictrum under the name *Thalictrum Anemonoides.* This change was accepted by De Candolle, and is now adopted by Gray, Bentham, and Hooker. Pursh described a one-flowered variety, but it is not generally considered distinct. Nothing is known of the chemical nature and constitution of any part of the plant.—L.

Properties and Uses.—But little is known concerning the therapeutical properties of this plant. Dr. S. E. Barber, of Connsville, Mo., informs

us that he has found it to be a valuable remedy in external and internal hemorrhoids, not accompanied with hemorrhage. The method of using it is to simply eat three or four of the small root-tubers, three times a day. We used some of the tubers, which he sent to us, in two cases of blind piles, and with apparent success. If further and more extensive trial of these tubers should confirm these conclusions as to their efficacy, it is probable that a fluid preparation could be made from them, possessing the same properties, and in a more convenient form.—K.

THAPSIA.

Nat. Ord.—Umbelliferæ. *Tribe.*—Laserpitieæ.

The root and prepared resin of Thapsia Garganica, *Linn.*

Description.—This plant is a perennial herbaceous plant, from two to four feet high, and a native of Spain and other parts of Southern Europe, and also found in Northern Africa. According to Dioscorides, it derives its name from the island of Thapsos, in which it was first discovered; in the time of Theophrastus it was found in abundance on the promontory called Gargano, hence its epithet of *Garganica.* It has a round, smooth *stem*, and three-pinnately compound *leaves*, which are borne on sheathing leaf-stalks. The *flowers* are in large, compound umbels, and the yellow petals are elliptical, and with an inflexed point. The *fruit* consists of two dorsally compressed carpels, which are nine-ribbed, with the two side ribs winged. The *root* is large, from one to two feet long, and from two to three inches in diameter at the thickest part.

History.—It contains an acrid milky juice when fresh, and yields a resin when dried. The root is the part employed in medicine, and has long been in use with the Arabs. The resin of the African variety is a strong irritant, both the resin and the dried root being exported from Algeria in considerable amounts. The resin is obtained by extracting the dry root with alcohol, distilling the tincture, and washing the residue with water.[1] It is soluble in alcohol, ether, and carbon disulphide; becomes plastic at 16° C. (60.°8 F.), has an amber-yellow color, and a specific gravity somewhat greater than that of water. It is said to be a component of a plaster made in France and sold under the name *Thapsia plaster.* Desnoix prepares this plaster as follows: Rosin fifteen parts, elemi twelve and a half parts, yellow wax eighteen parts, turpentine five parts, resin of Thapsia three and a half parts; melt the rosin, elemi, and wax together, and then add the turpentine and thapsia resin; strain through linen, and spread upon leather, *Dorvault, L'Officine*, 1872, p. 883. Thapsia also contains an irritating volatile substance, which affects the exposed skin of those distilling the alcoholic tincture, and who have, consequently, to exercise much care during the operation.—L.

Properties and Uses.—The properties of this plant reside in its resin, which has been employed as a vesicating or irritating plaster in rheumatic, neuralgic, and other local pains, and in all cases in which a counter-irritant is indicated. According to its mode of preparation, and the length of time it is allowed to remain upon the part, its effect may be varied from that of a slight redness to the production of an intense irritation with formation of vesicles; its action being, in this respect,

[1] *Reboulleau and Bertherand*, 1857.

similar to that of euphorbium, croton oil, mezereon, and other counter-irritants. It is more commonly employed in combination with other agents, to modify its more active effects. The tincture of the resin may be painted upon oil-cloth, adhesive plaster, or other material, and used as a local counter-irritant. Internally, this agent is not employed, though it is stated to possess emeto-cathartic properties.—K.

THYMOL.

Thymol. Thymic Acid.

Formula, $C_{10}H_{14}O$; molecular weight, 149.66.

Thymol was discovered by Caspar Neumann, in 1719. It was purified in 1853,[1] by M. Lallemand, who gave it the name "thymol," and ascribed the formula (old notation) $C_{20}H_{14}O_2$, the same being accepted at the present day as correct, corresponding to $C_{10}H_{14}O$ of the new notation. Thymol is a phenol of the ten carbon series, and is isomeric with carvacrol.[2] It is found in oil of thyme, oil of horsemint, and oil of Ptychotis Ajowan (a plant from the East Indies); the thymol of commerce being derived from thyme oil. Thymol exists in oil of thyme, associated with two substances of greater volatility, *cymene*, $C_{10}H_{14}$, and *thymene*, $C_{10}H_{16}$. Thymol may be obtained by distilling the pure oil of thyme; cymene and thymene pass over, and afterward the thymol, which may be received in a separate receptacle, and purified by crystallization from alcohol; or, the thyme oil may be agitated well with solution of caustic soda, the liquid which rises decanted, and the lower solution neutralized with hydrochloric acid, when thymol will rise upon the surface, and may be purified by crystallization from its alcoholic solution.

Thymol, when pure, crystallizes in large transparent crystals, of a peppery taste and pleasant odor, although that found in our market is usually somewhat colored, and strongly possesses the odor of oil of thyme.[3] Thymol melts at 44° C. (111°.2 F.), and boils at 230° C. (446° F.). It is soluble in from one thousand to twelve hundred parts of cold water; in its weight of alcohol; in one hundred and twenty parts of glycerin; and in less than its weight of caustic alkaline solution; and is very soluble in fats and oils. It is likewise soluble in ether, chloroform, disulphide of carbon, milk, and acetic acid. Its specific gravity is given at from 1.028 to 0.980 and 0.990, the variation being ascribed to difference of origin. The specific gravity 1.028 is generally accepted as accurate, and agrees with that of the *thymol* we have made from oil of thyme.

In making solutions of thymol with glycerin and water, it is best to triturate the thymol in a mortar with a small portion of alcohol, until it is dissolved, then add the desired menstruum.—L.

Properties and Uses.—Thymol is an antiseptic and disinfectant, and is considered by many, who have experimented with it, to be superior, in

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[1] *Comptes Rendus*, Sep., 1853, and *Pharm. Journ. and Trans.*, Vol. xiii.

[2] *Carvacrol, Oxycymene*, or *Cymenol*, was recently known as cymyl alcohol; it may be made by heating camphor with iodine; also by heating *carvol* (a constituent of oil of caraway) with phosphoric acid. It is not used in medicine.—L.

[3] Oil of origanum of commerce is usually the oil of thyme, often largely adulterated with spirits of turpentine. It has been stated that a large proportion of the oil of thyme *now* brought to this country is deficient in thymol, and recent practical experiments of the writer corroborate the assertion.

these respects, to phenic acid. By destroying the vitality of organized and living ferments, it prevents the occurrence of putrefaction, and arrests it when it has commenced. A small quantity of thymol added to albumen, milk, solutions of gum, or of gelatin, will preserve them for several months; and urine will be kept intact for several weeks. In contact with putrid pus, it promptly removes any odor emanating from this substance, and keeps it without change until complete dessication occurs. Applied to wounds, ulcers, or abscesses, in the form of a weak solution, it promptly modifies their condition, and accelerates cicatrization. Fifteen grains of thymol dissolved in two pints of distilled water, forms an invaluable disinfectant; this has been found effective in disinfecting sick rooms, and as a local application to prevent septicemia during the parturient period, as well as at other times when there is reason to fear its development. M. Paquet has preserved viscera, portions of limbs, etc., free from the least trace of putrefaction for several months, by means of the following solution: Take of thymol, tannin, each, one drachm, aniline half a drachm, glycerin three ounces; mix. When employed in the dressing of ulcers, etc., the following solution has been recommended by M. Giraldes: Take of thymol from half a drachm to a drachm, alcohol three fluidounces, distilled water thirty fluidounces; mix; this has been found to act efficaciously, even in cases in which iodine and other analogous topical applications had been fruitlessly employed. It is not necessary to employ too strong a solution, as pure thymol possesses caustic properties. M Paquet has derived great benefit in dressing ulcers by the following: Take of thymol half a drachm, alcohol (85 p. c.) two fluidrachms, distilled water thirty-three fluidounces; mix. These solutions may be applied on lint, or by spray. Concentrated thymol may be advantageously substituted for monohydrated nitric acid, or nitrate of silver, in cauterization of the dental nerves; it does not leave so disagreeable an odor in the mouth as is the case with phenic acid.

Thymol has been employed in inhalations, by Bouillhon, Paquet and others, in bronchial and other affections of the respiratory organs, attended with gangrenous exhalations. The respiratory mucous membranes become excited, the expectoration is diminished, becomes thinner and less tenacious, contains a much smaller amount of mucin, and is more freely passed. It suppresses the gangrenous odor, and prevents the diseased bronchial surfaces, and the abnormal secretions covering them, from undergoing butyric fermentation, thus checking a poisoning of the blood. Ten drops of a thick, concentrated solution of thymol are placed in a small glass flask, furnished with a cork, through which passes two bent glass tubes, one descending nearly to the bottom of the flask, the other being short. This latter is held in the patient's mouth, who will aspire the air charged with the vapor of the thymol. These inhalations should be continued for four or five minutes, each time, and be repeated eight or ten times per day. Ten drops of the solution will suffice for inhalation during four or five days. If, during the inhalation, a slight sense of pricking is experienced in the posterior region of the pharynx, the inhalation should be suspended until this sensation passes off, and then be again continued. M. Lewin considers thymol very useful in diphtheria and other similar diseases dependent upon the action of living organisms; also in arresting the hypersecretion of various mucous membranes. In cases in which fermentation occurs in the stomach with dilatation of this organ, he states that

thymol acts promptly in arresting the accompanying vomitings, and gradually effects a contraction of this dilated cavity.

M. Baelz, who has made some comparative experiments with thymol and salicylic acid[1] (in the service of M. Wunderlich) upon persons in health, and also those affected with typhoid fever, articular rheumatism, phthisis and pyelitis, states that in doses of one-sixth of a grain, repeated several times, no effect was observed; in order to obtain an appreciable therapeutical result, it was necessary to give daily from twenty-five to thirty grains. Upon coming in contact with the buccopharyngeal mucous membrane, the medicine occasioned a pricking sensation and a disagreeable taste; there was seldom any nausea, and vomiting occurred but once among thirty-six persons. Upon increasing the dose, a slight, but transient, sense of heat was experienced in the epigastrium; and, in some cases, a diarrhea analogous to that in typhoid fever. In the majority of cases, half an hour or an hour after the ingestion of thymol, more or less limited and profuse sweats appeared, but in all cases less than those occasioned by salicylic acid or jaborandi. An increase in the quantity of urine was frequently noticed; and the urine presented a dark, greenish color, as if it contained blood, and appeared a yellowish-brown when illuminated by reflected light. A solution of perchloride of iron added to the urine rendered it cloudy, and of a whitish-gray color. When the gray predominated, it reminded of an icteric urine, or even of a nephritic urine mixed with blood; the absence of albumen, however, prevented any mistake as to the latter cause. The nervous phenomena were represented by tinnitus aurium, deafness, and a sense of constriction at the temples.[2]

Dr. B. Kussner has found that from three to five drops of a one per cent. solution of thymol was beneficial in diarrhea of children. Thymol injected into the veins lowers the temperature and induces stupor. Animals poisoned with it pass into a deep coma; after death their blood is dark and fluid, but no fatty degeneration of internal organs is observed. *Med. Press and Circ.*

The preferable forms for the internal administration of thymol are either to dissolve it in an alcoholic drink, or to form it into a thick, emulsioned fluid; but, thus far, the employment of this agent has been confined chiefly to its use as a topical application, and to utilize its antiseptic properties. The advantages derived from its internal administration have been very limited. The following has been advised as a method of preparing it into pills, the soap being indispensable to assure the division of the thymol: Take of thymol, three grains; medicinal soap, six grains; *excipient*, a sufficient quantity; mix thoroughly, and divide into twenty pills. An ointment has likewise been advantageously employed, by thoroughly triturating together from two to twenty drops of a thick, alcoholic solution of thymol with one ounce of vaseline or pure lard. This has been used as a local application in burns, eczema psoriasis, tinea, lichen, and other cutaneous affections, and as a parasiticide. When much hyperemia is present, it must not be applied until this has been allayed. A very powerful antiseptic may be made thus: One part of thymol and twelve parts of chloral hydrate are triturated together, and then an equal quantity of camphor added,

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[1] In doses of from thirty to sixty grains, M. Baelz considers its action, as an antipyretic, decidedly inferior to that of salicylic acid.—K.

[2] *Archiv. der Heilkunde.* Bd., xiv, 3, 4 Heft.

when the mixture assumes a liquid form; these proportions may be varied, if deemed necessary.—K.

TRIGLOCHIN.

Nat. Ord.—Alismaceæ. *Sub Ord.*—Juncagineæ.

The herb of Triglochin maritimum, *Linn.*

Common Name.—Arrow-grass.

Description.—This is an herbaceous plant, found in marshes and other damp situations throughout the United States, especially near the sea coast. It has numerous narrow, grass-like, but fleshy, *leaves*, all radical and sheathed at the base. The *flowers* are very small, greenish, and borne in slender, spicate racemes on erect scapes, which are from one to two feet high. The sepals are three, ovate; the petals are also three, and colored green like the sepals. The pistil consists of six united ovaries, which divides, in fruit, into six dry, linear, one-seed carpels.

Triglochin palustre, a smaller species, with only three carpels, is found in similar situations. Both species grow in Europe. We have not been able to find a report of its constituents and think it has never been examined chemically.—L.

Properties and Uses.—Triglochin maritimum is said to be much sought after by cattle in its vicinity, especially subsequent to frost; they thrive upon it, and grow fat; while, with cows giving suck, it greatly increases the quantity and richness of their milk. Dr. E. F. Jones, of Colorado, reports it to be an active diuretic, of considerable value in kidney and bladder affections. To be employed in infusions.—K.

TRIMETHYLAMIN.

Formula, $N(CH_3)_3$; molecular weight, 58.92.

Description.—Trimethylamin is isomeric with propylamin, under which name it was described by the older works; it was discovered by Wertheim (1850), and first employed in medicine by Awenarius, a physician of St. Petersburg (1854). It may be obtained from ergot, rust of wheat, and the flowers of some species of Rosaceæ, also from fish-brine, and crude cod-liver oil, the latter substances furnishing the "propylamin" of commerce. Codein and narcotin yield it, when decomposed by distillation with caustic-potash. It is most readily prepared, with economy, from fish-brine, by mixing the brine with excess of slaked lime, distilling, then saturating the distillate with hydrochloric acid, and evaporating. Exhaust the residue with alcohol, filter, evaporate the filtrate to dryness, and distil carefully from an excess of slaked-lime made into paste with water. As thus obtained, it contains a little water, from which it may be mostly freed by shaking with ether, decanting the ethereal solution and evaporating in a vacuum.

Trimethylamin, $N(CH_3)_3$, is a colorless fluid of a strongly alkaline character, has an odor similar to that of herring-brine, boils at 9.°8 C. (49.°6 F.), is soluble in every proportion in alcohol, water and ether, and forms soluble salts with bases.

Hydrochlorate of Trimethylamin is chiefly used in medicine, and is often known under the improper name "Chloride of Propylamin." It is made by decomposing the crude hydrochlorate, obtained from brine,

with caustic lime or potash, passing the vapor of trimethylamin, that is given off, into dilute hydrochloric acid, evaporating this solution, thus obtained, and recrystallizing the residue from stronger alcohol. It is a white, deliquescent salt, of a slight odor, a saline taste, and soluble in alcohol and water. (When heated to 260° C. (500° F.), it decomposes into ammonia trimethylamin and methyl chloride, *Allen.*)

PROPYLAMIN (normal) C_3H_9N, is obtained by hydrogenation of proprionitril (C_3H_5N), or of cyanide of ethyl; and may also be prepared by other chemical processes. It is a strongly alkaline liquid, boils at 50° C. (122° F.), has the specific gravity 0.7283 at 0° C. (32° F.), and forms a platinochloride which crystallizes in orange-yellow monoclinic prisms (*Fowne*). It is not used in medicine.—L.

Properties and Uses.—Trimethylamin has a depressive action upon the pulse and the temperature, reducing the former from two to eighteen beats per hour, and the latter from one to three degrees; depending upon the dose administered, and the condition of the person experimented upon. It appears to exert no action upon the surface of the body unless applied with friction, when it occasions rubefaction. Upon mucous membranes it has an irritating and caustic action, on which account it is necessary, in administering it, to employ it in mixtures. It appears to possess no diaphoretic or diuretic effect, and, properly given, occasions no derangement of the digestive organs. According to M. Peltier, the physiological action of trimethylamin is, a gentle excitant of the skin, a caustic to the mucous membrane, a sedative to the nervous system, a hyposthenizant to the arterial system, and a modifier of urea in the urine, diminishing its amount considerably; therapeutically, it calms the pains in rheumatism, diminishes the articular congestion, at the same time rapidily reducing the fever. The hydrochlorate of trimethylamin occasions the same effects, and is generally preferred for therapeutical use, on account of its taste and odor being more agreeable. These agents have been highly recommended in acute articular rheumatism, in which they promptly allay the pain, and effect the cure in a very short time, from four to twelve days. They have likewise been found promptly efficacious in the treatment of chorea. The method pursued by Awenarius is probably the best for the administration of trimethylamin, as follows: To six fluidounces of peppermint water add two drachms of white sugar, and twenty-four drops of trimethylamin. The dose of this is half a fluidounce, to be repeated, according to the urgency of the case, every two, three or four hours. The dose of the hydrochlorate of trimethylamin is from five to fifteen grains in the course of twenty-four hours. It may be prepared for administration in a very agreeable form as follows: Mix together, hydrochlorate of trimethylamin one hundred and fifty-four grains, tincture of the yellow rind of orange one fluidounce, syrup two pints: the dose of this is from half a fluidounce to one and a half fluidounces.—K.

TURNERA.

Nat. Ord.—Turneraceæ.

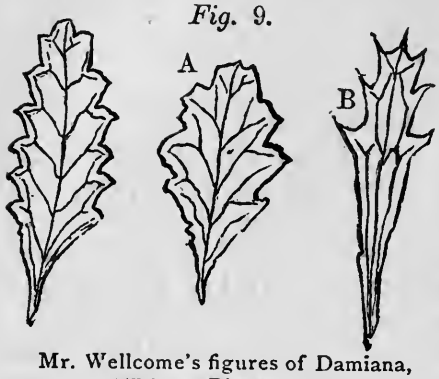
The leaves and top of Turnera Aphrodisiaca, *Ward* and *Vasey.*

Common Name.—Damiana.

History and Description.—This drug was introduced in 1874, by Dr. F. O. St. Clair, and first appeared in the form of a fluid extract, from

the firm of Messrs. Helmick & Co., of Washington, D. C. Three distinct varieties or species of plants under the name of Damiana, are now found upon the market, and are derived from as many different sources In connection with the history of this drug, it may be stated that Mr. H. S. Wellcome, read a paper upon the subject, before the New York Alumni Association of the Philadelphia College of Pharmacy, October 15th, 1875, at the same time exhibiting cuts of leaves, which were known upon the market, at that time, as "Damiana," reproduced by us (*Fig.* 9).

Fig. 9.



Mr. Wellcome's figures of Damiana, (*Chicago Pharmacist.*)

The true Damiana, the kind originally introduced by Dr. F. O. St. Clair,[1] who, we are informed, obtained it from Mr. Eugene Gillespie, the U. S. Consul at Cape San Lucas, is derived from Mexico (see *Fig.* 10). The botanical source of the drug has never been definitely ascertained. It is evidently from a Mexican species of Turnera, supposed, by E. M. Holmes, to be a smooth-leaved variety of *T. microphylla, D. C.* Prof. Lester F. Ward, on the examination of authentic specimens obtained from Dr. St. Clair, concluded that the drug is obtained from an undescribed species of Turnera, which Prof. Vasey and himself designated *Turnera Aphrodisiaca*, and this name we shall accept for the Mexican Damiana, until further light is thrown upon the subject. The result of Prof. Ward's examination can be found in the *Virginia Med. Monthly*, April, 1876.

Fig. 10.

Turnera Aphrodisiaca, *Ward* and *Vasey.* (T. Damiana.) Natural Size.

The genus Turnera is a small family of chiefly tropical American plants allied to the Passifloreæ. The *flowers* are small, yellow, and, in the species that produces Damiana, subsessile near the end of the short branches. The calyx is tubular, hairy externally, colored like the petals, and five-toothed at the apex. The petals are five, yellow, and inserted on the tube of the calyx. The *fruit*, specimens of which are often found with Damiana leaves, are dry, one-celled, globular, and about the size of a large hemp seed (*Fig.* 10, B B). They are warty and rough externally, open by three valves, and contain from three to six kidney-shaped seeds (*Fig.* 10, C, magnified) attached to three parietal placentæ. Mexican Damiana (*Turnera aphrodisiaca*) as found in market, consists of broken leaves mixed with fragments of the branches, and, sometimes, with seed-pods. The branches have a reddish-brown bark, and are covered, when young, with white, cottony hairs. The leaves (*Fig.* 10, natural size) are less than an inch long, obovate, wedge-shape,

[1]We extend our thanks to Dr. St. Clair for the aid given us in our endeavor to obtain the complete history of this drug, as well as for the specimens of original damiana so kindly furnished by himself. In this connection we can say that the leaves of (*Fig.* 10), marked A A are drawn from the original lot of damiana imported by Dr. St. Clair in 1872—L.

and taper at the base to a short slender leaf-stalk; when young, they are covered with a slight pubescence, but become smooth when old. They are distinctly pinnately veined, and the margin is toothed with from eight to ten teeth.

A variety of Damiana, closely resembling the preceding, is derived from California. It was ascertained by Mr. E. M. Holmes to be obtained from *Turnera microphylla*, *D. C.*, a small shrubby plant, native of Lower California and Northern Mexico. The leaves resemble the Mexican, but are broader, and covered with white hairs on both sides (*Fig.* 9, A).

A second kind of California damiana (also a species of Turnera) has lately made its appearance in the market. We are indebted to Mr. Jas. G. Steele for the fact that this lot of damiana came from San Diego, California, and grew inland, at the southern part of the State. The leaves have the shape of the Mexican damiana, but are larger, and very hairy, and especially underneath (*Fig.* 11, natural size).

Fig. 11.

California Damiana. (Species of Turnera.) Natural Size.

The most common drug, however, that is sold on the market under the name of *damiana* is obtained from *Aplopappus discoideus*, *D. C.*, a Compositæ plant of the section *Asteroideæ*. It is one of the few rayless species of *Aplopappus*, and is referred by some to the genus *Linosyris*. It has no botanical relation to the true damiana, and can only be considered a sophistication. The leaves (*Fig.* 12, natural size, and Wellcome's *Fig.* 9, B) of this plant, as found on the market, are thick, firm, and not so much broken up as the Turnera; the surface of the leaf is rough, resinous, dotted, the mid-rib being prominent; but the veinlets are indistinct. The teeth are toward the apex of the leaf, and are rather remote and sharp. This plant can readily be distinguished from the true damiana by the presence of numerous flower-heads, which are common in all the specimens examined by us (*Fig.* 12, A). They are borne in axillary clusters of from four to six heads. The involucre is bell-shape, and consists of numerous coriaceous imbricated scales, pubescent on the tips. The achenia (*Fig.* 12, B, magnified) is covered with a dense appressed pubescence, and bears a tawny, scabrous, spreading, unequal pappus.

Fig. 12.

Aplopappus Discoideus. (Spurious Damiana.) Natural Size.

The sensible properties of the leaves of all the varieties (or species) of Turnera found upon the market, under the name of Damiana, are similar. All have a fragrant odor, resembling lemon balm, and a pleasant, slightly aromatic taste. The leaves impart their virtues readily to hot water, as well as to mixtures of water and alcohol. When distilled with water, the distillate from the leaves yields an essential oil; this oil is lighter than water, possesses the characteristic odor, and imparts to the plant its fragrance.

The spurious damiana, Aplopappus discoideus (*Fig* 12), is entirely different. It resembles more nearly the Grindelias, both in odor and taste. It is very resinous, and imparts its characteristic properties most freely to strong alcohol. Water hardly affects it, and mixtures of water and alcohol imperfectly exhaust the resinous principles, and do not permanently retain in solution such portions as are extracted. This spurious damiana need never be unintentionally employed, as both the general appearance of the leaf, and the sensible characteristics, are entirely different from all the species of Turnera. According to our experience, however, it can be purchased in the market at half the price of true damiana, and those who simply regard cheapness, and the name "damiana," may, when purchasing, expect, as the rule, to receive the spurious article.—L.

Properties and Uses.—This drug has been almost eulogized for its positive aphrodisiac effects, acting energetically upon the genito-urinary organs in both sexes, removing impotence in the one, and frigidity in the other, whether due to abuses or to age. Many physicians who have tried it, deny its possession of such virtues, but the friends of the drug attribute their failures to the use of the spurious articles. It will very likely be found to possess laxative, tonic, and diuretic properties only; and the aphrodisiac effects following its use, no more prove that these belong to it, than the same effects. that not unfrequently appear after the employment of many other agents, prove that such agents possess similar excitant virtues. The dose of the fluid extract is from half a fluidrachm to half a fluidounce.—K.

VERBESINA.

Nat. Ord.—Compositæ. *Tribe.*—Senecionideæ.

The leaves and tops of Verbesina Virginica, *Linn.*

Common Names.—Crown-beard; Gravel-weed.

Description.—This is a tall, perennial plant, found growing in open situations in the southern part of the United States. It has a pubescent, branched *stem*, which is winged by the decurrent leaves, and grows from three to six feet high. The alternate *leaves* are ovate, downy beneath, and irregularly toothed or lobed. They taper at the base to a winged leaf-stalk, and the lower ones are decurrent on the stem. The *flower-heads* are numerous, and borne in dense, compound, terminal corymbs. They have pale-yellow disks, and a few white, oval, fertile rays. The *fruit* is a flattened, narrowly winged, achenium, bearing a couple of erect awns. The genus Verbesina, is an extensive family of American plants, mostly in Mexico and South America. Two species are indigenous to the United States, *V. Virginica* and *V. Siegesbeckia*, both natives of the Southern States. Of their chemical constitution nothing is known.—L.

Properties and Uses.—This article has not until now been introduced into our Materia Medica. According to Dr. J. C. Kendrick, Texas, who has made extensive use of it in his practice, a strong decoction proves a certain diuretic; he has found it almost a specific in gravel, and in vesical tenesmus. He believes that it exerts a solvent effect upon calculi in the bladder, but it will require repeated and careful trials before such a belief can be accepted; nevertheless, it certainly deserves to be tested in the cases he has named. The decoction may be used freely.—K.

SUPPLEMENT.

PART II.

PHARMACY AND PHARMACOPŒIA.

N. B.—The reader is referred to the Materia Medica, Part I, of this Supplement, for the medical properties and uses of preparations, when not named under their respective heads in the present Part.—K. & L.

EXTRACTUM MALTII.

Extract of Malt.

Preparation.—Take of fresh barley malt any desired amount, water a sufficient quantity; heat the water to a temperature of from 100° to 150° F., and moisten the malt with a portion of it. Pack the moistened malt, loosely, in a cylindrical percolator of suitable size, and then add more of the water, at the same temperature, until the percolate appears at the exit. Now close the exit with a cork, and allow the whole to macerate, in a warm place, for from three to six hours. At the expiration of this time, unclose the exit, and allow the percolation to proceed, adding fresh supplies of heated water, until the percolate has yielded, in weight, an amount equal to twice that of the malt employed. Lastly, evaporate at a temperature ranging from 80° to 94° C. (about 180° to 200° F.), with constant stirring, to the consistence of a soft extract.

History.—In the preceding process, if the operation of the percolation be neglected, or if the percolate be allowed to stand a short time previous to evaporation, fermentation will speedily ensue, and the resulting extract will have an acid, disagreeable taste. If the temperature be permitted to rise above the boiling point of water, after the extract has become somewhat concentrated, a burnt flavor will be imparted to it. Genuine extract of malt is a translucent, reddish-brown, adhesive substance, of an agreeable, somewhat sweetish, but not positively saccharine taste. An infusion of pure malt has the correct flavor peculiar to fresh malt, and evaporation does not appreciably increase its sweetness; therefore, should any extract of malt have a decidedly syrup-like taste,

it may be suspected that some sweetish substance has been added to it, either to overcome the effects of fermentation or to increase the consistence of the extract without the proper evaporation. Glucose appears to be peculiarly adapted for these purposes, and if the fermentation be not excessive, the addition of this substance will accomplish both objects. This is, probably, the only adulterant that will be found.—L.

Properties and Uses.—This article was introduced into this country from Germany, where it had been used for some time as a tonic and nutrient in anorexia, chronic bronchitis, phthisis, asthma, dyspepsia, convalescence from exhausting maladies, and in all diseases accompanied by general debility and impairment of the vital powers; its beneficial effects in these diseases appear to be due to the diastase and the nutritive principles entering into its composition. It forms an excellent substitute for malt liquors in those cases where even a gentle stimulant is contra-indicated. At the present time our manufacturers have thrown many malt preparations upon the market, into which, iron, cod-liver oil, pepsine, quinia, iodides, etc., enter, and apparently without regard to the compatibilities or incompatibilities of the articles thus thrown together; and it is doubtful whether such mixtures exert as beneficial results in the diseases for which they are recommended, as would ensue were the drugs taken separately, and alternately, with the malt extract. The dose of extract of malt is from one to four fluidrachms in milk, or in soup, repeating it three times a day.—K.

EXTRACTUM MALTI COMPOSITUM.

Compound Extract of Malt. Extract of Malt and Hops.

Preparation.—To one-part of fresh Hops, ground, add nine parts of Malt (one in ten), and make an extract in the same manner as directed for the simple Extract of Malt.

The odor of the hops is not observed in this preparation owing to the subsequent evaporation, but the bitter taste remains quite distinct. There are many mixtures at present upon the market that contain a greater or lesser amount of extract of malt, but it is not in accordance with our purpose to describe them.—L.

Properties and Uses.—This preparation differs from the preceding only in the presence of hops, which may impart to it a slight hypnotic influence. It may be used in the same cases, and in the same doses, as named for the extract of malt.—K.

FLUID EXTRACTS.

GENERAL DIRECTIONS.

Recognizing the necessity for good and reliable concentrated preparations of our various therapeutical agents, we here introduce formulas and processes for making Fluid Extracts of all the drugs described in this Supplement, of which such fluid elaborations are demanded; and we are confident that if these processes be carefully conducted, liquids will be produced that will represent (with two exceptions, *chestnut* and *malt*), for each troy ounce (very nearly) of the material employed a corresponding fluidounce of finished Fluid Extract. The variation from this standard will not be greater than might be expected from crude materials that are gathered at different seasons, or that are ob-

tained from various sources. We are assured, from practical experience, that each formula and process is correct and practical. The menstruum employed in each instance, is believed to be that which is the best adapted for the extraction, and subsequent retention in solutions of those principles of the drug that are considered its active therapeutical constituents.

It will be observed that maceration is employed in some instances where percolation is objectionable, as in Fluid Extract of Chestnut, and of Mangifera Indica; and, likewise, that where the application of heat to a reserved tincture, would be apt to destroy or evaporate its therapeutical properties, the heat is dispensed with, and we obtain the desired result by other means, as in the preparation of Fluid Extract of Eucalyptus.

We are satisfied from actual experiment that the processes generally adopted by works on Pharmacy, failed in producing Fluid Extracts that fully represent the drugs employed; that is, a pint of finished extract corresponding to sixteen troy ounces of the drug. This difficulty, we believe to have overcome, by directing sixteen troy ounces, of material to be employed,—the product being a liquid extract, varying in bulk from ten to fourteen fluidounces as the character of the drug requires. In every case, we have considered the menstruum simply as to its power of dissolving and retaining the therapeutical principles of the various drugs subjected to its action, without any regard to coloring matters, gums, etc. This being our only object, it will be noticed that formulas and processes have been furnished that will yield light-colored, or greenish and mobile preparations, in instances where other menstruums acting upon the same material would result, in thick, gummy, or mucilaginous, and, perhaps, nearly black liquids from the presence of inert extractive matters; in the latter case, the extract being deficient in the genuine medicinal principles.

FINENESS OF POWDERS.—*Very fine* (dusted) powders are those that have been passed through a silk sieve of eighty or more meshes to the linear inch, or, powders in the form of dust, produced where the materials are pulverized in a chaser; powders are termed *moderately fine*, when passed through a wire sieve of forty meshes to the linear inch; *coarse*, when passed through a wire sieve of twenty meshes to the linear inch; and *bruised*, when articles which agglutinate and refuse to be sifted, are crushed as finely as possible by concussion in an iron mortar. The powders generally sold upon the market are such as we designate by *very fine* (dusted), being usually dusted by means of a chaser.

MOISTENING THE POWDER FOR PERCOLATION.—Place the powder in an evaporating dish of ample capacity, and pour upon it the amount of menstruum directed in the formula, stirring the powder constantly, then, when the balance of the menstruum is added, rub the mixture between the palms of the hands quickly and thoroughly, until the lumps disappear and a smooth mixture is produced; lastly, pass this mixture through a sieve of from ten to twenty meshes to the linear inch, and then transfer it immediately to the wide-mouth bottle as directed, that it may undergo maceration.

OBJECT OF THIS MACERATION.—It is often found that after a percolator has been packed, the menstruum, when added, passes in considerable proportion *between* the powder and the glass. This results from the fact that the menstruum, used in moistening, has not been absorbed by the powder, and hence, after the powder has been packed in the percolator, the menstruum penetrates the powder, contraction results, and

the material separates from the surface of the percolator, thus presenting a crevice into which the menstruum passes more rapidly than it does in permeating the material. Previous maceration of the moistened powder of half an hour overcomes this difficulty.

THE PERCOLATOR should be of glass where moderate amounts of material are operated upon. Large quantities require tin or wood. In all cases they should be nearly cylindrical, slightly conical, and of such diameter that the powder would occupy *at least* twelve inches in perpendicular height when properly packed.

TO PREPARE THE PERCOLATOR FOR PERCOLATION.—Provide a tapering cork which will perfectly close the exit or discharging aperture, so that when the percolate appears, the flow may be at once arrested. Then slice one side of the cork wedge-shape, commencing at the small end, as shown in *Fig.* 13, care being taken that the cut does not extend beyond that part of the cork which closes tightly the exit of the percolator. Now, place a layer of cotton upon the bottom of the percolator, as shown by *Fig.* 14, A; and, if convenient, a smooth layer of silver sand upon the cotton.

Fig. 13.

The sixteen troy ounces of powder intended for percolation should, as soon as it is ready, be placed into the percolator, about one-fourth its bulk at a time; the surface should be smoothed after each addition, and then pressed as directed, for each drug. It is necessary that the pressure be even throughout the entire mass, otherwise the liquid will select the more porous portions, and thus yield a defective percolation.

It is best to select some flat circular body or disk to use in pressing the powder, and for this purpose a circular stick of wood, with a smooth end, in thickness about two-thirds the diameter of the inside of the percolator, answers very well, care being taken that all portions of the surface of the powder are submitted alike to the pressure.

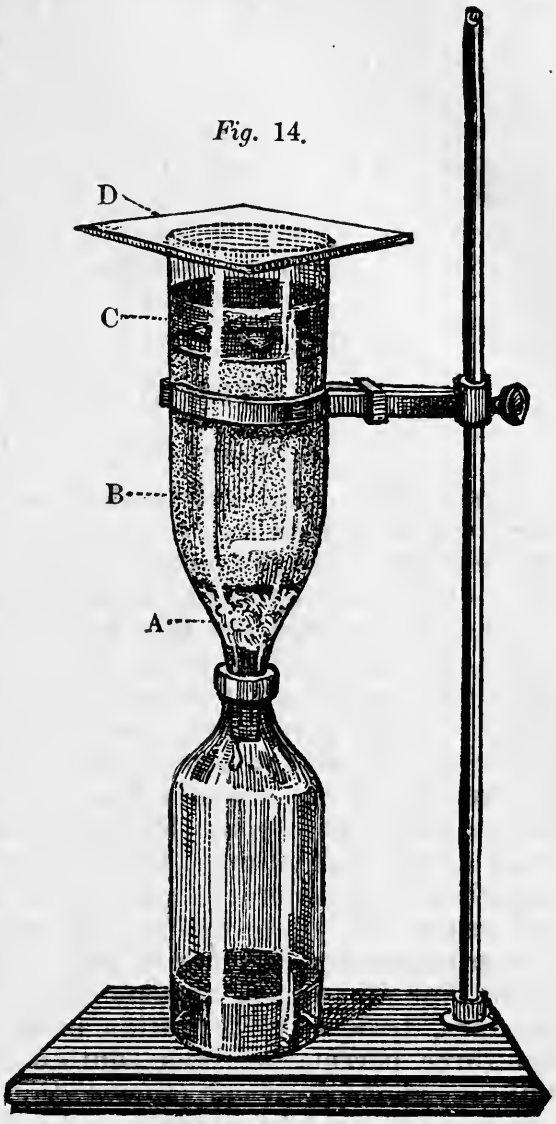
By *moderately*, we understand the pressure of from five to ten pounds; *firmly*, from fifteen to twenty pounds; and *very firmly*, the convenient pressure of one hand, not to exceed fifty pounds. Some little practice with a pair of spring balances will enable the operator to form an idea of the pressure required.[1] Having the powder properly packed, and the surface smooth, cut a piece of filtering paper to fit closely within the percolator, and place it upon the surface of the powder, and upon this place a few fragments of glass to retain it in position. Then add the menstruum, as directed, and cover the percolator with a plate or disk of ground glass; and, when the percolate appears, close the orifice tightly with the cork, and proceed according to the process given for making the particular extract. It must be observed that the cork is not inserted in the exit of the percolator until the *percolate* has appeared. When the period of maceration is over, gently twist and slowly withdraw the cork until the slit previously cut upon its side permits the liquid to pass in drops, without running in a stream. The object of the

[1] Dr. E. R. Squibb, in *New Remedies*, Jan., 1879, suggests "moderately" as a pressure of forty-five pounds; firmly, sixty pounds; and hard, seventy-five pounds, or more. This will answer very well for large quantities, or where the pressure is exerted upon a considerable surface, as with "both hands," thus, in reality, reducing the actual pressure upon each square inch to, or below, that given by us, which is intended to apply to only sixteen troy ounces of material. We are assured, from experience, that the operator will work to disadvantage if a greater pressure is employed than advised by us with our menstruums, and in like quantities of material.—L.

repeated macerations and fractional percolations, as directed by us is to overcome imperfect moistening and packing of the powder, and to subject the same to the most thorough maceration. We object to filtration of the finished fluid extract, as the rule, and seldom find it necessary where care is taken in packing and otherwise preparing the percolate and the material for percolation.

In conclusion, we will state that the weight of a fluid extract can not in the least determine its therapeutical value, unless the gravity can be increased or diminished by the therapeutical constituents of the drug employed. The gums of most of our plants are valueless in medicine, and yet their presence determines, to a great extent, the *thickness* and gravity of an extract. A drug may be rich in gums, or other extractive matters, and deficient in characteristic medicinal principles; or, the menstruum may be adapted to the extraction of the inert elements that will give gravity and color to the extract, and yet be utterly unfit to dissolve the *active* principles of the plant. For these reasons, we can not accept that the weight, or specific gravity, of a fluid extract is a criterion of therapeutical value, and we, therefore, do not give gravity as a test.—L.

Fig. 14.



EXTRACTUM ALSTONIÆ CONSTRICTÆ FLUIDUM.

Fluid Extract of Alstonia Constricta.

Preparation.—Take of the inner bark of Alstonia constricta, in very fine powder, *sixteen troy ounces*; Alcohol, a *sufficient quantity*. Moisten the powder with eight fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner,

draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with alcohol from the commencement, and until the end of the percolation.

Fluid extract of Alstonia constricta is of a dark-yellowish red color, odorless, and possesses the intense bitterness peculiar to the drug. When prepared according to the foregoing formula, it seems to represent very nearly the entire sensible properties of the bark employed, troy ounce to each fluidounce of the finished extract, although reports from practitioners favor the employment of the inner bark in substance.—L.

EXTRACTUM ALSTONIÆ SCHOLARIS FLUIDUM.

Fluid Extract of Alstonia Scholaris.

Preparation.—Take of the bark of Alstonia scholaris, in moderately fine powder, *sixteen troy ounces;* of a menstruum of Alcohol three parts, Water, two parts (by measure), *a sufficient quantity;* moisten the powder with eight fluidounces of the menstruum. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add fresh menstruum, until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with the menstruum from the commencement, and until the end of the process of percolation.

Fluid extract of Alstonia scholaris is of a reddish color, odorless, possesses a bitterish taste, and as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract.—L.

EXTRACTUM ANEMOPSIDIS FLUIDUM.

Fluid Extract of Anemopsis, or of Yerba Mansa.

Preparation.—Take of the root of Anemopsis, in very fine powder, *sixteen troy ounces;* Alcohol, *a sufficient quantity.* Moisten the powder with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular

piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw three fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of three fluidounces. Lastly, mix the three percolates. The surface of the powder must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Anemopsis is of a reddish color, possesses the odor and taste of the plant, and as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract.—L.

EXTRACTUM APLOPAPPI FLUIDUM.

Fluid Extract of Aplopappus. Fluid Extract of False Damiana (Aplopappus).

Preparation.—Take of the leaves of the Apolappus, in very fine powder, *sixteen troy ounces;* Alcohol *a sufficient quantity.* Moisten the powder with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Apolappus is green or yellowish-green in color, as prepared by the foregoing formula, and possesses the balsamic odor and taste of the plant. It represents very nearly the quality of the drug employed, troy ounce to fluidounce.

Water is objectionable in a fluid extract of this plant, as the resinous principles, so abundant, are thereby largely lost. When a menstruum is used, which is composed of mixtures of water and alcohol, the resultant fluid extract is of a reddish-brown color, and of a much thicker consistence. It must be remembered that this plant is a spurious damiana (see page 157).—L.

EXTRACTUM BERBERIS AQUIFOLII FLUIDUM.

Fluid Extract of Berberis Aquifolium.

Preparation.—Take of the root of Berberis Aquifolium, in moderately fine powder, *sixteen troy ounces*; of a menstruum of Alcohol three parts, Water two parts (by measure), *a sufficient quantity*. Moisten the powder with six fluidounces of the menstruum. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press moderately. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add fresh menstruum until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with the menstruum from the commencement, and until the end of the process of percolation.

Fluid extract of Berberis Aquifolium is of a yellowish-red color, odorless, or nearly so, and very bitter to the taste, and as thus prepared, represents very nearly the quality of the drug employed, troy ounce to each fluidounce of the finished extract.—L.

EXTRACTUM BRYONIÆ ALBÆ FLUIDUM.

Fluid Extract of Bryonia Alba.

Preparation.—Take of Bryonia root, in moderately fine powder, *sixteen troy ounces*; Alcohol and Water, each *a sufficient quantity*. Moisten the bryonia with three fluidounces of water, and permit the mixture to stand one hour in a well-corked wide-mouth bottle. Then intimately rub it with six fluidounces of alcohol, and allow the mixture to macerate an hour as before. Introduce this, with moderate pressure, into a cylindrical percolator, three inches in diameter, that has been previously prepared for percolation, according to directions given on page 162. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add a mixture of Alcohol, by measure, three parts, with Water, by measure, two parts, until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of

two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with menstruum from the commencement, and until the end of the process of percolation.

Fluid extract of bryonia is dark-red in color, and, as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract. The preliminary use of water in moistening this drug brings it to a condition which favors the ready permeation of the menstruum.—L.

EXTRACTUM CASTANEÆ FLUIDUM.

Fluid Extract of Chestnut.

Preparation.—Take of Chestnut leaves, bruised, *sixteen troy ounces;* of a menstruum of Alcohol, six parts; Water, ten parts (by measure), *a sufficient quantity.* Moisten the bruised leaves with ten fluidounces of the menstruum, press moderately into a wide-mouth bottle, and add menstruum until the surface of the powder is covered with it. Then cork the bottle, and place it in a warm situation until four days have passed, when it must be removed and pressed until liquid ceases to pass. The matter within the press should now be rubbed through a coarse sieve, and then covered with menstruum as before, be again placed in the wide-mouth bottle, and, after maceration, submitted to pressure. Six fluidounces of the liquid obtained by means of the first part of the operation must now be reserved, and the remainder be mixed with that obtained from the second maceration, and this mixture be evaporated to the measure of four fluidounces, by means of a water-bath. This is to be mixed with the six fluidounces of reserved liquid, and to this mixture two fluidounces of alcohol must be slowly added, with constant stirring. The resulting fluid extract will represent about two troy ounces of chestnut leaves in three fluidounces of the finished preparation.

Fluid extract of Chestnut leaves is a thick mucilaginous liquid, of a reddish-brown color, and an astringent, sweetish taste. It can not well be prepared by percolation, unless the alcohol be in excess, and in this case the mucilage of the leaves is not dissolved. It is consequently desirable to employ only sufficient alcohol to prevent fermentation during the operation, and afterward to act as a preservative. (See remarks on page 61.) A characteristic of reliable fluid extract of chestnut is its mucilaginous nature, and, if this peculiarity is wanting, it may be inferred that the preparation under consideration is defective.—L.

EXTRACTUM CONDURANGO FLUIDUM.

Fluid Extract of Condurango.

Preparation.—Take of Condurango bark, in moderately fine powder, *sixteen troy ounces;* of a menstruum of Alcohol, three parts; Water, two parts (by measure), *a sufficient quantity.* Moisten the Condurango with six fluidounces of the menstruum. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press moderately. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add fresh menstruum until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and

place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with the menstruum from the commencement, and until the end of the process of percolation.

Fluid extract of Condurango is dark reddish-brown in color, of an aromatic taste, slight odor, and, as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract.—L.

EXTRACTUM COTO FLUIDUM.

Fluid Extract of Coto.

Preparation.—Take Coto of bark, in very fine powder, *sixteen troy ounces;* Alcohol, *a sufficient quantity.* Moisten the Coto with six fluidounces of alcohol. Cork tightly in a wide mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Coto is of a reddish color, possesses an aromatic odor and a hot taste, followed by a numbness of the tongue, and, as thus prepared, it represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract. A mixture of alcohol and water will produce a much darker fluid extract; but alcohol is the best solvent for the characteristic medicinal principles of the drug, and the coloring matter observed in the aqueous extract is undesirable. The addition of water to the menstruum also renders the finished extract more prone to precipitation.—L.

EXTRACTUM ERIODICTYONIS GLUTINOSII FLUIDUM.

Fluid Extract of Eriodictyon Glutinosum.

Preparation.—Take of Eriodictyon glutinosum leaves, bruised, *sixteen troy ounces;* Alcohol, *a sufficient quantity.* Moisten the bruised leaves with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the bruised leaves with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly, cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw three fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of three fluidounces. Reserve and mix the three percolates; then continue the percolation until twelve fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved ten fluidounces. The surface of the bruised leaves must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Eriodictyon glutinosum is dark brownish-green in color, and possesses the exact odor and taste of the plant, and as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract. It should never be made with a menstruum which contains water as a constituent, alcohol being best adapted to extract and to hold in solution those resinous principles of the plant to which its therapeutical virtues are generally considered to be owing.—L.

EXTRACTUM EUCALYPTI FLUIDUM.

Fluid Extract of Eucalyptus.

Preparation.—Take of Eucalyptus leaves, in moderately fine powder, *sixteen troy ounces;* Alcohol, *a sufficient quantity.* Moisten the Eucalyptus with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw three fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of three fluidounces. Lastly, mix the three percolates. The surface of the powder must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Eucalyptus is dark brownish-green, or green, in color, and possesses the odor and taste of the leaves, and as thus prepared, represents very nearly the quality employed, troy ounce to each fluidounce of the finished extract. It should never be made with alcohol diluted with water or glycerin.—L.

EXTRACTUM GALANGAL FLUIDUM.

Fluid Extract of Galangal.

Preparation.—Take of Galangal root, in fine powder, *sixteen troy ounces;* Alcohol, *a sufficient quantity* Moisten the galangal with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with alcohol from the commencement. and until the end of the process of percolation.

Fluid extract of Galangal is of a reddish color, and possesses the exact odor and taste of the drug. It should not be black, or thick, and if such is the case with any specimen, it may be inferred that the menstruum used was a mixture of alcohol and water, instead of alcohol. Alcohol freely extracts all the sensible properties of galangal, and the admixture of water or glycerin is objectionable.—L.

EXTRACTUM GENTIANÆ QUINQUEFLORÆ FLUIDUM.

Fluid Extract of Gentiana Quinqueflora.

Preparation.—Take of the root of Gentiana quinqueflora, in moderately fine powder, *sixteen troy ounces;* of a menstruum of Alcohol three parts, Water two parts (by measure), *a sufficient quantity.* Moisten the powder with six fluidounces of the menstruum. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press moderately. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add fresh menstruum until the percolate appears at the exit. Then cork the exit tightly; cover the percolate, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto

the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with menstruum from the commencement, and until the end of the process of percolation.

Fluid extract of Gentiana Quinqueflora is of a yellowish-red color, odorless, and very bitter to the taste; and thus prepared it represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract.—L.

EXTRACTUM GRINDELIÆ ROBUSTÆ FLUIDUM.

Fluid Extract of Grindelia Robusta.

Preparation.—Take of the leaves and flowering-heads of Grindelia robusta, bruised, *sixteen troy ounces;* Alcohol, *a sufficient quantity.* Moisten the Grindelia with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the bruised herb with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw three fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of three fluidounces. Reserve, and mix the three percolates; then continue the percolation until twelve fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved ten fluidounces. The surface of the bruised herb must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Grindelia robusta is yellowish-green, or green in color, and possesses the exact odor and taste of the plant, and as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract.

It will not do to use a menstruum composed of mixtures of water and alcohol, even though the water be in small proportion. The resinous substances of this plant mainly possess its characteristic medicinal principles, and any addition of water prevents their extraction in direct proportion to the water employed, and subsequently renders the extract liable to a continual deposition of matters that can not be permanently held in solution. In this latter case, the fluid extract will be of a dark reddish-brown color instead of greenish.—L.

EXTRACTUM GRINDELIÆ SQUARROSÆ FLUIDUM.

Fluid Extract of Grindelia Squarrosa.

Preparation.—Take of the leaves and flowering-heads of Grindelia

squarrosa, bruised, *sixteen troy ounces;* Alcohol, *a sufficient quantity.* Moisten the Grindelia with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the bruised herb with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw three fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of three fluidounces. Reserve, and mix the three percolates; then continue the percolation until twelve fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved ten fluidounces. The surface of the bruised herb must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

The remarks regarding the fluid extract of G. robusta, are equally applicable to the present preparation.—L.

EXTRACTUM MALTI FLUIDUM.

Fluid Extract of Malt.

Preparation.—Take of fresh Barley Malt, *thirty-two parts;* Water, *a sufficient quantity.* Heat the water to a temperature of from 100° to 150° F., and moisten the malt with a portion of it. Pack the moistened malt, loosely, in a cylindrical percolator of suitable size, and then add more of the water, at the temperature of the preceding, until the percolate appears at the exit. Now, close the exit with a cork, and allow the whole to macerate, in a warm place, for from three to six hours. At the expiration of this time, unclose the exit, and allow the percolation to proceed, adding fresh supplies of heated water until the percolate has yielded, in weight, an amount equal to twice that of the malt employed. Evaporate the percolate at a temperature ranging from 180° to 200° F. (80° to 94° C.), until the liquid is reduced to twelve parts, by weight. Allow this to cool, and then add four parts of alcohol, by weight, and filter.

Fluid extract of malt possesses the taste of fresh malt, but is not sweet, and as prepared by the preceding process, will not ferment. It represents in each fluidounce the soluble principles of one and a half troy ounces of malt.—L.

EXTRACTUM MANGIFERÆ FLUIDUM.

Fluid Extract of Mangifera.

Preparation.—Take of the bark of Mangifera Indica, in moderately fine powder, *twenty troy ounces;* of a menstruum of Glycerin, six fluidounces, Water, ten fluidounces (by measure), *a sufficient quantity.* Add the powder to sixty-four fluidounces of the menstruum, in a suitable vessel, and let it macerate for twenty-four hours, with occasional stirring. Then place it in a muslin strainer, and express; filter the expressed liquid through paper.

Return the material within the muslin strainer to the vessel, add thirty-two fluidounces of water, and allow this to macerate for twenty-four hours; when it must be expressed and filtered, as at first. Mix the two filtrates, and, by means of a water-bath, evaporate until the fluid is reduced to thirteen fluidounces, when three fluidounces of alcohol is to be added.

Mangifera Indica is one of the most difficult substances we have ever examined to extract by percolation, providing the menstruum is adapted to take up the tannates with which the bark abounds. In such a case, the menstruum will seldom penetrate beyond an inch or so into the powder, even if it is very coarse; therefore, we prefer and employ maceration. Fluid extract of Mangifera is of a dark ruby-red color when in thin layer, of a peculiar odor, and a sweetish (glycerin) and very astringent taste.—L.

EXTRACTUM PEUMI BOLDO FLUIDUM.

Fluid Extract of Peumus Boldo; Fluid Extract of Boldo.

Preparation.—Take of Boldo leaves, in very fine powder, *sixteen troy ounces;* Alcohol, *a sufficient quantity.* Moisten the boldo with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Boldo is dark green in color, of a disagreeable wormseed-like odor and taste, and as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract.—L.

EXTRACTUM PILOCARPI PENNATIFOLII.

Fluid Extract of Pilocarpus Pennatifolius; Fluid Extract of Jaborandi.

Preparation.—Take of Jaborandi leaves, in very fine powder, *sixteen troy ounces;* of Alcohol and Acetic Acid, each, *a sufficient quantity.* Moisten the powdered leaves with a mixture of six fluidounces of alcohol and two fluidrachms of acetic acid. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder

with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Jaborandi is dark-green in color, almost odorless, possesses the taste of the drug, and, as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract. If the fluid extract be made with mixtures of water and alcohol, the dark-colored extractive matters of the leaves are dissolved, and the extract will have a dark reddish-brown color, but will not be as satisfactory as though made with alcohol, either from a pharmaceutical point of view or a therapeutical. The addition of the acetic acid favors the extraction of the pilocarpin, and, by using it in connection with alcohol, both the volatile oil and alkaloid of the drug are dissolved.—L.

EXTRACTUM PIPERIS METHYSTICI FLUIDUM.

Fluid Extract of Piper Methysticum.

Preparation.—Take of the root of Piper Methysticum, in moderately fine powder, *sixteen troy ounces;* of a menstruum of Alcohol, three parts, Water, two parts (by measure), *a sufficient quantity.* Moisten the powdered root with six fluidounces of the menstruum. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press moderately. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add fresh menstruum until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with the menstruum from the commencement, and until the end of the process of percolation.

Fluid extract of Piper Methysticum is of a reddish-brown color, and imparts the taste of the root. It is odorless, and, as thus prepared, rep-

resents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract.—L.

EXTRACTUM POLYMNIÆ UVEDALIÆ FLUIDUM.

Fluid Extract of Polymnia Uvedalia; Fluid Extract of Bear's-foot.

Preparation.—Take of the root of Polymnia Uvedalia, in moderately fine powder, *sixteen troy ounces;* Alcohol *a sufficient quantity.* Moisten the powder with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Polymnia uvedalia is reddish-brown in color, of a disagreeable fœtid odor and taste, and as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract. Any addition of water or glycerin to the alcohol composing the menstruum, is to be avoided, as they occasion loss of resinous constituents.—L.

EXTRACTUM RHAMNI PURSHIANÆ FLUIDUM.

Fluid Extract of Rhamnus Purshiana; Fluid Extract of Cascara Sagrada.

Preparation.—Take of the bark of Rhamnus Purshiana, in moderately fine powder, *sixteen troy ounces;* of a menstruum of Alcohol three parts, Water two parts (by measure), *a sufficient quantity.* Moisten the powder with six fluidounces of the menstruum. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add fresh menstruum, until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate.

Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with menstruum from the commencement, and until the end of the process of percolation.

Fluid extract of Rhamnus Purshiana is dark yellowish-red in color, almost odorless, of a disagreeable, bitterish taste, and as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract.—L.

EXTRACTUM RHUS AROMATICÆ FLUIDUM.

Fluid Extract of Rhus Aromatica.

Preparation.—Take of the bark of the root of Rhus aromatica, in fine powder, *sixteen troy ounces;* Alcohol, *a sufficient quantity.* Moisten the powder with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Rhus aromatica is of a brownish color, and possesses the disagreeable turpentine-like odor and taste of the root. It should not be made with a menstruum containing water, or glycerin, as these bodies prevent the resinous constituents of the root from dissolving. As prepared by the foregoing formula, the extract represents very nearly those constituents of the root soluble in alcohol, troy ounce to fluidounce.—L.

EXTRACTUM SABBATIÆ ELLIOTTII FLUIDUM.

Fluid Extract of Sabbatia Elliotti; Fluid Extract of Quinine Flower.

Preparation.—Take of the herb and root of Sabbatia Elliotti, in moderately fine powder, *sixteen troy ounces;* diluted Alcohol, a *sufficient quantity.* Moisten the powder with six fluidounces of diluted alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press mod-

erately. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add diluted alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with diluted alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Sabbatia is of a dark color, odorless, of a disagreeable bitter taste, and as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract.—L.

EXTRACTUM SUMBUL FLUIDUM.

Fluid Extract of Sumbul.

Preparation.—Take of Sumbul root, in moderately fine powder, *sixteen troy ounces;* Alcohol *a sufficient quantity.* Moisten the powder with six fluidounces of alcohol. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with alcohol from the commencement, and until the end of the process of percolation.

Fluid extract of Sumbul has a dark reddish-brown color, a disagreeable and acrid taste, and possesses the musk-like odor of the root, and as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract. Water or glycerin are detrimental, inasmuch as either will prevent the solution of the resin of the root, and can not, in return, dissolve a single therapeutical constituent known to us, that is insoluble in alcohol. When the fluid extract is made with mixtures of alcohol and water, it is very much darker in color than when alcohol only is employed, but is inferior as a therapeutical agent.—L.

EXTRACTUM THALICTRI ANEMONOIDIS FLUIDUM.

Fluid Extract of Thalictrum Anemonoides.

Preparation.—Take of the herb and root of Anemone Thal., in moderately fine powder, *sixteen troy ounces;* Diluted Alcohol, *a sufficient quantity;* moisten the Anemone with six fluidounces of the menstruum. Cork tightly in a wide mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press moderately. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add diluted alcohol until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with the menstruum from the commencement, and until the end of the process of percolation.

Fluid extract of Anemone is of a reddish-brown color, and imparts the taste of the plant and as thus prepared, represents very nearly the quality of drug employed, troy ounce to each fluidounce of the finished extract.—L.

EXTRACTUM TURNERÆ APHRODISIACÆ FLUIDUM.

Fluid Extract of Turnera Aphrodisiaca; Fluid Extract of Damiana.

Preparation.—Take of the leaves of Damiana, in moderately fine powder, *sixteen troy ounces*; of a menstruum of Alcohol three parts, Water two parts (by measure), *a sufficient quantity.* Moisten the powdered leaves with six fluidounces of the menstruum. Cork tightly in a wide-mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 162, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add fresh menstruum until the percolate appears at the exit. Then cork the exit tightly; cover the percolator, and place it in a warm situation. After twenty-four hours, loosen the cork, and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluidounces are obtained. Again close the exit, macerate twenty-four hours, and, in a manner like unto the preceding, draw four fluidounces of percolate. Repeat the maceration, and, in like manner, draw a third portion of four fluidounces. Reserve, and mix the three percolates; then continue the percolation until eight fluidounces are obtained. Evaporate this latter portion until reduced to the measure of two fluidounces, and mix with the reserved twelve fluidounces. The surface of the powder must be constantly covered with men-

struum from the commencement, and until the end of the process of percolation.

Fluid extract of Damiana has a fragrant, herbaceous, balm-like odor and taste, and as thus prepared, represents very nearly the quality of the drug employed, troy ounce to each fluidounce of the finished extract.—L.

GLYCERITA.

GLYCERITES.

By this class of preparations is generally understood solutions of medicinal substances in glycerin, although in certain instances the various Pharmacopœias deviate to an extent.

GLYCERITUM ACIDI CARBOLICI.

Glycerite of Carbolic Acid.

Preparation.—Take of Carbolic Acid, in colorless crystals, *one troy ounce;* Glycerin, *four fluidounces.* Melt the carbolic acid by the heat of a water-bath, then add the glycerin, previously warmed, and stir or agitate together until a transparent solution is obtained. The proportions of the above are in accordance with those of the *United States* and the *British Pharmacopœias.*—L.

Properties and Uses.—This has been beneficially employed as a local application in several forms of cutaneous disease, attended with intense itching, as prurigo, psoriasis, etc., likewise in parasitical affections of the skin, as tinea, pityriasis, itch, etc.—K.

GLYCERITUM ACIDI GALLICI.

Glycerite of Gallic Acid.

Preparation.—Take of Gallic Acid, *one troy ounce;* Glycerin, *four fluidounces.* Powder the gallic acid in a mortar, then gradually add the glycerin, rubbing the mixture constantly, until an even mixture is effected. Transfer this to a porcelain evaporating dish, and warm gently upon a water-bath, stirring constantly until the acid dissolves.—L.

Properties and Uses.—This preparation has been taken internally, instead of gallic acid in substance, in the several varieties of disease in which this acid is indicated, and is supposed to be more promptly absorbed when used in this form. Its dose is from ten minims to a fluidrachm. Externally, it has been applied to the scalp, in cases of alopecia.—K.

GLYCERITUM ACIDI SALICYLICI.

Glycerite of Salicylic Acid.

Preparation.—Take of Salicylic Acid (made from winter-green oil), Borax (in fine powder), each, *sixty grains;* Glycerin, *two fluidounces.* Triturate the acid with the borax, in a mortar, until thoroughly mixed; then add the glycerin, and rub until a clear solution is obtained.—L.

Properties and Uses.—This preparation will be found very useful in all maladies in which salicylic acid is indicated. It may be used internally, as well as externally, and constitutes a useful local application in several diseases of the mouth and pharynx, in gangrenous ulcers, leucorrhea, offensive discharges, pediculi, pruritus, etc. The dose internally is from half a fluidrachm to two fluidrachms.—K.

GLYCERITUM ACIDI TANNICI.

Glycerite of Tannic Acid.

Preparation.—Take of Tannic Acid, *one troy ounce;* Glycerin, *four fluidounces.* Powder the tannic acid in a mortar, then gradually add the glycerin, rubbing the mixture constantly, until an even mixture is effected. Transfer this to a porcelain evaporating dish, and warm gently upon a water-bath, stirring constantly until the acid dissolves.—L.

Properties and Uses.—This forms a useful local application in bleeding from cuts, leech bites, epistaxis, sore nipples, anal fissure, chronic coryza, spongy gums, vaginal leucorrhea, and chronic mucous inflammations in which the mucous membrane is relaxed. Chronic diseases of the skin, as eczema, impetigo, tinea, lichen, etc., have also been greatly benefited by its application.—K.

GLYCERITUM AMYLI.

Glycerite of Starch.

Preparation.—Take of Starch, *one ounce;* Glycerin, *eight fluidounces.* Rub them together until they are intimately mixed; then transfer the mixture to a bright, iron dish, and apply the heat of a sand-bath, gradually raised to 280° F., stirring the mixture constantly until the starch particles are completely dissolved, and a transluscent jelly is formed. Care must be taken to continually remove the solidifying mass from the bottom of the vessel with a spatula, and, as soon as the entire mass becomes translucent, to remove it from the fire.[1] Glycerite of starch is a translucent mass of the consistence of an ointment.—L.

Properties and Uses.—Glycerite of starch forms a bland preparation, very useful in cases in which it is desired to apply mild, non-irritating dressings, as in the burning heat of eczema, in excoriated surfaces, in erythema, and in several other irritated or inflamed conditions of the skin. It likewise forms a vehicle for the application of other agents with which it may be mixed.—K.

GLYCERITUM PICIS LIQUIDÆ.

Glycerite of Tar.

Preparation.—Take of Tar, *one troy ounce;* Glycerite of starch, *eight troy ounces.* Transfer the tar to a mortar, and gradually add the glycerite of starch, stirring constantly until an even mixture results.[2] It is advisable to previously warm the glycerite of starch.—L.

Properties and Uses.—This preparation forms a very useful local application in lichen, prurigo, pityriasis, psoriasis, lepra, herpes, erythema, eczema, tinea, pruritus, and alopecia; also in indolent and gangrenous ulcers. It may be rubbed upon the affected part, or be spread on a piece of linen and thus applied. It is very apt to afford more or less relief, even when it does not remove the disease.—K.

GLYCERITUM SODII BORATIS.

Glycerite of Borate of Sodium; Glycerite of Borax.

Preparation.—Take of crystallized borate of sodium (Borax), *one troy ounce;* Glycerin, *eight fluidounces.* Rub the borax in a mortar until it is finely powdered; then gradually add the glycerin and rub together until the borax is dissolved.—L.

Properties and Uses.—This preparation is employed, locally, in aphthæ,

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[1] See *New Remedies*, 1879, p. 199.

[2] *New Remedies*, 1879, p. 200.

thrush, and other forms of stomatitis, in fissured and ulcerated nipples, in eczema, lichen, intertrigo, in parasitic cutaneous diseases, and especially in pityriasis of the scalp. It is also useful in aphthous and ulcerative conditions of the vulva. It most generally relieves the burning and itching attending many cutaneous maladies.—K.

LIQUOR OF ERGOTIN.

M. Yvon's Solution of Ergotin.

Preparation.—Coarsely powder ergot, and deprive it of its fixed oil by washing it with rectified disulphide of carbon; then dry it in the open air and protected from the light until the odor of the solvent has entirely disappeared. Introduce this powder into a cylindrical percolator, and exhaust it in the cold by distilled water, to every one thousand grams (thirty-three fluidounces) of which, two grams (thirty troy grains) of tartaric acid have been added. Heat the liquid obtained, so as to coagulate any albuminous matters that may be present in it, then filter, and by means of a water-bath, evaporate it to about one-third of its volume. When cool, filter, digest the filtered liquid with a slight excess of recently precipitated carbonate of calcium so as to saturate the excess of tartaric acid. Filter, evaporate to the consistence of thick syrup, and precipitate with alcohol of sp. gr. 0.822, added in such quantity as to furnish with the aqueous liquid an alcohol of sp. gr. 0.871. Again filter, and then evaporate to drive off the alcohol. Exhaust the residuum by the addition of distilled water in quantity slightly less than that of the weight of the ergot employed, a little animal charcoal being used. Again filter, and to the filtered liquid add, for each one hundred grams (three troy ounces one drachm) of ergot employed, fifteen centigrams (two and a third troy grains) of salicylic acid. Complete the process by adding distilled water, in such quantity as to obtain a weight of liquid equal to that of the ergot employed in the preparation of the solution. Allow this to rest for several days in a cool place, and then pour it into small vials, having well fitted ground stoppers.

History.—Hypodermic injections of ergotin are rapidly coming into favor with the profession, being employed in various forms of disease. One great objection, heretofore, to their employment, has been the irritating quality of the solutions used, occasioning abscesses, and indurations. M. Yvon has succeeded in forming a solution wholly free from irritating principles, the process for preparing which, as described by himself, we have deemed proper to present to our readers. The liquid obtained by this process is of a fine amber color, clear, non-fermentable, and keeps well; all the re-agents of the alkaloids form abundant precipitates with it. One gram of this solution represents one gram of ergot, and it contains the obstetrical and hemostatic principles of this drug.—L.

Properties and Uses—The facility with which this solution may be employed in hypodermic injections, its rapidity of action, and its efficacy, render it superior to any other mode of administration. When it is properly made, it is innocuous, and occasions neither pain nor inflammation. It has been successfully employed in *post partum* hemorrhages, the only unpleasant symptom observed being a sudden headache with vertigo, nausea, and syncope, which pass off in a few minutes by placing the patient in a horizontal position—but no symptoms resembling that of poisoning. Its effects are better manifested in passive hemorrhages due to inertia or atony of the uterus. The use of this solution by subcutaneous injections has likewise been found efficacious

in excessive menorrhagia, epistaxis, hemoptysis, and other profuse and obstinate hemorrhages, as gastrorrhagia, enterorrhagia, cerebral hemorrhage, and in secondary hemorrhages following surgical operations. They have likewise been of service in uterine fibroma; the soft, vascular, hemorrhagic tumors, of rapid development during the sexual life, being more readily influenced by the ergotin; while, on the contrary, the long-standing, hard, voluminous, stationary tumors, and which have formed adhesions or undergone fatty degeneration, especially with females who have reached or passed the critical age, are hardly, if at all, influenced by it. Subcutaneous injections of ergotin have also proved effective in prostatic enlargement, goitre, prolapsus of the rectum, purpura hemorrhagica, internal aneurism, diabetes insipidus, paraplegia, paralysis of the bladder, and enlargement of the spleen, especially when the result of malarial influences.

Vidal states that ergotin has a special influence upon the fibers of the smooth muscles. M. Benard, who has given considerable attention to the subject, sums up his conclusions as follows:

Subcutaneous injections of ergotin act upon hemorrhages by causing contraction of the smooth fibers of the blood-vessels, or of those of the organs enclosing them. They appear to act locally at the point where the ergotin is in contact with the tissues, but this action does not appear to be independent of the influence of the nervous system. Contraction of the smooth vascular fibers acts especially by modifying the tension of the blood; contraction of the fibers of the organs containing them acts especially by effacing their caliber—compressing them. Injections of ergotin appear to act efficaciously, even in hemorrhages of organs deprived of smooth fibers, or presenting few of them in their structure, as in gastro-intestinal hemorrhages, hemoptysis, and epistaxis. Hemorrhages of organs in which the smooth fibers predominate; that is to say metrorrhagia, are almost constantly cured or ameliorated by injections of ergotin. Their influence is especially manifest in the gravid condition of the uterus, or in conditions approaching it, as moles, intra-uterine fibromæ. It is likewise very energetic every time the muscular fiber of the organ is healthy, even when a portion of the organ is already destroyed, as by cancer. In cases of metritis, and especially of fungous growths, their influence is about null. When carefully made, and a properly prepared solution employed, no serious symptom results.

The dose of ergotin, by hypodermic injection, varies according to circumstances, from one-sixth of a grain to five grains per day. Some practitioners have even exceeded this quantity, using from three to ten grains daily. The quantity of Yvon's solution of ergotin will, therefore, be from one-sixth of a minim to five minims per day. The fractions of a minim may be made by adding water to the solution, thus: To obtain one-sixth of a minim, add one minim of the solution to twenty-three minims of distilled water; four minims of this mixture will equal the sixth of a minim of solution. The injections should be made in the neighborhood of the diseased part, and be repeated, according to circumstances, every two, three, or four days. In uterine myoma, M. Gerard prefers to inject directly into the uterine tissue. In profuse hemorrhages, from three to five or ten minims may be used at a time, and, if necessary, may be repeated every four, eight, or twelve hours, according to the urgency of the case, and the effect of the agent. In enlarged spleen, from one to five grains of ergotin have been injected daily.—K.

APPENDIX.

Under this head we shall briefly refer to several articles that have recently been introduced (or re-introduced) to the profession, some of which, undoubtedly, possess valuable therapeutical qualities.—K. & L.

ADONIS VERNALIS.

This is the most common of the cultivated species of the genus *Adonis*, being a very reliable early spring flower. It is found, growing wild, throughout Southern Europe, and is sometimes employed in medicine on account of its drastic properties. Mr. F. Linderos recently obtained a yellow crystalline substance from the leaves and identified it as *aconitic acid*, $C_6H_6O_6$. Pallas attributes to the plant emmenagogue properties.—L.

ÆTHYL BROMIDE.

Bromide of Ethyl; Hydrobromic Ether.

Formula, C_2H_5Br.; molecular weight, 108.69.

Bromide of ethyl was discovered by Serullas, in 1827, who made it by acting upon phosphorus with bromine, in contact with alcohol. In 1852, Mr. E. Robin experimented upon birds with this agent, and was pleased with its action as an anesthetic. He stated that it produced rapid effects, without any subsequent suffering or distress. In 1865, Dr. Nunnelly experimented farther; and afterward, Dr. Rabuteau (1876) made some careful investigations regarding its action; while still more recently, Drs. Lawrence Turnbull and R. J. Levis, of Philadelphia, have brought the agent prominently before the medical profession, and to them belongs the credit of its recent introduction into medicine.

Preparation.—The original process for making bromide of ethyl was troublesome and dangerous. It was improved upon by De Vrij, bromide of potassium being decomposed in contact with alcohol, by means of sulphuric acid. This is the favored process at the present day, and we call attention to the two practical modifications of it given in the *Am. Journ. Pharm.*, May, 1880.[1] Take of Bromide of Potassium, in crystals, fifty-eight parts; Sulphuric Acid, forty-four parts; Alcohol, forty-four parts; Water, twenty-eight parts. Introduce the mixed water and sulphuric acid[2] into a tubulated retort of one hundred and sixteen parts capacity, and when the mixture has become cool, add the Bromide of Potassium. Then place the retort on a sand-bath, and fix in its tubulure a funnel-

[1] The articles were written by Lawrence Wolff, M. D, and Prof. Jos. P. Remington. We prefer that of Prof. Remington, from the fact that he adds the alcohol slowly to a warmed mixture of the sulphuric acid, water, and bromide of potassium, although the formula of Dr. Wolff will give satisfactory results.—L.

[2] Observe precautions given in note on page 10.—L.

tube, and connect the exit with a condenser; heat the mixture to 116° C. (240°.8 F.), and then slowly supply alcohol, until the forty-four parts are consumed. The heat, during the reaction, must be maintained between 100° C. (212° F.) and 116° C. (240°.8 F.), and be continued after the alcohol is added, until it reaches 116° C., when the operation must be discontinued. The distillate, crude ethyl bromide, must be very carefully purified, as follows: Mix it with an equal bulk of distilled water, previously rendered distinctly alkaline with caustic soda or caustic potash, and agitate the mixture violently. After it has separated into two layers, marked by a clear line of demarcation, syphon the lower liquid into a retort, add a little chloride of calcium, and distil the mixture upon a water-bath. This distillate must be redistilled from a clean retort, by means of an expanded steam, or water, bath.

Bromide of ethyl is transparent, colorless, volatile, has an agreeably ethereal odor, and a penetrating, sweetish taste. It is not inflammable, and its vapor will neither burn nor explode. Its specific gravity is 1.420 (*Remington*), and its boiling-point 40° or 41° C. (104° and 105°.8 F.). It dissolves freely in alcohol and ether, but is comparatively insoluble in water. It should, in all cases where intended for use as an anesthetic, be perfectly volatile at ordinary temperatures, and, when evaporated from a clean glass or porcelain plate, by exposure, it should not leave a stain, and the plate should be devoid of all odor.—L.

Properties and Uses.—We have noticed the remarks of Drs. Lawrence Turnbull, and R. J. Levis, of Philadelphia, Pa., relative to the safety and efficacy of ethyl bromide as an anesthetic. These gentlemen have employed this agent in a great number of cases without any serious accident occurring, and consider it fully as safe an anesthetic as ether, decidedly more so than chloroform, and superior to either; but a pure article must always be employed. Dr. Levis states that its action is rapid, and the patient quickly recovers from its effects. Its vapor is non-inflammable, and not irritating to the respiratory passages, influencing respiration but slightly, if at all; the circulation is not affected by it, except sometimes a slight augmentation in the rapidity of the heart's action, and perhaps a trifling increase of arterial tension or pressure. Nausea and vomiting occur less frequently than with ether or chloroform, and its inhalation does not occasion cerebral anemia or fatal syncope from cardiac depression, so frequently following the employment of chloroform.—K.

BAEL FRUIT.

Bael fruit, or Indian quince, is known in India as Bhel and Bela. It is the fruit of *Ægle Marmelos* and belongs to the *Aurantiaceæ*. The fruit resembles the orange in appearance, has a delicious flavor and pleasant odor when ripe. The thick rind of the unripe fruit is astringent and is used in India for dysentery and diarrhea. A yellow dye is prepared from the rind when the fruit is ripe.—L.

In Malabar, the root, bark, and leaves of this plant, have refrigerant properties attributed to them, and are considered of great value, in hypochondria, melancholy, palpitation of the heart, and in asthma. The ripe fruit is very agreeable to the taste, and is used for the removal of habitual constipation. A fluid extract of the rind of the unripe fruit may be given in diarrhea and in dysentery, in doses of from thirty minims to two fluidrachms every two or three hours.—K.

BALSAMUM DIPTEROCARPI.

Wood Oil; Gurjun Balsam.

This oil, according to Dr. Masters, is mainly derived from *Dipterocarpus lævis*, although authorities agree that many trees of the genus *Dipterocarpus* yield it also. This genus consists of lofty trees which abound in resinous juices, and which are natives of the Indian Islands and neighboring countries. The source of the balsam was first announced by Roxburgh, and the process for extraction as then given is employed by the natives at the present day. To obtain the balsam, the trees are notched near the ground, and the notch charred by means of a fire, when the liquid oozes out and is collected. Roxburgh states that a single tree will yield from thirty to forty gallons in a season. This liquid is a thin balsam, somewhat resembling balsam of copaiba, although different specimens of it differ considerably as regards consistence, in accordance with the source from which it is derived. Its common name is *wood oil*, and, in its native country, it is employed extensively as a varnish and in painting houses and ships. According to Dr. Wight, when mixed with dammar, it is valuable as a coating to preserve timber from the attacks of white ants.

Gurjun Balsam dissolves in benzol, chloroform, disulphide of carbon, and essential oils, the solutions being fluorescent (greenish). It is composed of a volatile oil, a resin, and an acid named gurjunic acid (gurgunic, *Warner*). The oil may be obtained by distillation with water, to the extent of thirty-seven per cent. of the balsam employed, and, when pure, has the specific gravity 0.915 (*Pharmacography*); 0.944 (*Warner*). The resin has not been satisfactorily examined chemically. It contains the *gurjunic acid*, $C_{44}H_{68}O_8$, which forms a soluble salt with ammonia, and may thus be separated from the resin by triturating the resin with dilute ammonia water, filtering the solution, adding muriatic acid in excess, collecting the precipitate, and purifying by crystallization from boiling alcohol.

WOOD OIL of CHINA.—An article extensively used in China under the name *wood oil*, is obtained by pressure from the seed of Aleurites cordata (Tung tree), a large tree of the *Nat. Ord.* Euphorbiaceæ. The oil is used in painting boats, varnishing furniture, etc. As it is not exported it can not be confused in market with gurjun balsam—L.

Gurjun balsam has been advised as an efficacious substitute for balsam of copaiba, in chronic gonorrhea, gleet, and chronic affections of the mucous membrane of the bladder. It has likewise been reputed beneficial as a stimulant to obstinate ulcers, when added to the ointment employed in dressing them.—K.

CALYCANTHUS FLORIDUS, *Linn.*

Florida Alspice.

Nat. Ord.—Calycanthaceæ; a shrub, native of the Southern States, and common in cultivation both in this country and Europe. The stem is from six to eight feet high and much branched. The leaves are opposite, entire, coriaceous, oval and borne on short leaf-stalks. The entire plant is pervaded with an aromatic camphoraceous odor which is especially the case with the bark and roots. The flowers are nearly sessile and borne near the ends of the branchlets. They are of a brownish-purple color, and exhale, especially when wilted or crushed, an abundant fragrance compared by some to that of the strawberry.—L.

This plant has recently been suggested for use in medicine as a stimulant and aromatic; its virtues in these respects are, very probably, in no way superior to the many agents already named in our Materia Medicas, possessing similar properties.—K.

CEDRON SEED.

The fruit of Simaba Cedron, a species of Simarubeæ, closely allied to the tree that produces quassia bark. This is a small tree, native of New Granada and neighboring parts of South America. It is characterized by having large pinnate leaves, consisting of numerous narrow leaflets and very large panicles of flowers. The fruit is about the size of a "swan's egg," and contains a single seed. The seeds are intensely bitter, and are esteemed by the natives as an antidote to the bites of poisonous snakes, insects, etc.—L.

The seeds appear to possess tonic and febrifuge properties, and are recommended for malarial diseases, and to improve the condition of the digestive powers when enfeebled, and in dyspepsia; for these purposes, an infusion may be employed; or a fluid extract may be taken, in doses of from one to ten minims, repeated three or four times a day.—K.

CERCIS CANADENSIS (*Linn*).

Nat. Ord.—Leguminosæ; the Red Bud, or Judas Tree, is a small tree, growing in rich woods in the Middle States. The flowers expand in early spring before the leaves come out; they are borne in lateral clusters and are of a pale-reddish color. They have an agreeably acid taste, and are often eaten by children. The leaves are simple, acute, cordate, and are supported on slender stalks. The fruit is a dry, brown flat pod, which hangs on the branches during the winter.—L.

It has been stated that the leaves and bark of this tree, especially the bark of the root, possess astringent properties, and may be administered in cases in which this class of agents are indicated, as in diarrhea and dysentery, and in chronic catarrhal conditions; also recommended as a local application in chronic gonorrhea, gleet, leucorrhea, and chronic conjunctivitis.—K.

DIOSPYROS EMBRYOPTERIS (*Pers.*),

Or Indian persimmon tree, is found in India, Java, and neighboring tropical islands; but is not valued highly for its fruit, which is insipid. When green, they are very astringent, and are employed in tanning. The inspissated juice has been used in diarrhea; it is thick and viscid, and has been employed in India as a preservative for coating fishing nets, and the seams of boats. The unripe fruit was admitted into the *Pharmacopœia* of India in the year 1868.

DIOSPYROS KAKI, the Chinese Date Plum, or Japanese Persimmon, is a native of China and Japan, and is cultivated in India. The fruit is of a bright-red color, about the size of an ordinary apple, and, when ripe, is eaten by the Chinese, and, when dried, is made into sweetmeats. The bark of this probably resembles that of other species of *Diospyros*, and is an astringent.—L.

The bark of the D. Kaki has recently been advised as an astringent in chronic mucous affections, as in certain forms of dyspepsia, in diarrhea and dysentery, in mucous diseases of the bladder and urethra,

and as a local application in leucorrhea, gleet, chronic conjunctivitis, and catarrhal affections. The fluid extract, diluted with water, may be applied locally, by injection, or by spray.—K.

DUGONG OIL.

The Dugong (*Halicore Dugong*) is an herbaceous mammal found in shallow waters throughout the Indian Seas. There are two species of them—the Malay, or Indian Dugong (*Halicore Indicus*), and the Australian (*Halicore Australis*). They are from six to sixteen feet in length, and weigh from four hundred to six hundred pounds upon an average; occasionally, however, they are found of larger size. They frequent the neighborhood of ocean inlets where sea-grass, algæ, and fuci abound, and the water is shallow. They are called sea-hogs, and their flesh (intermediate in flavor between beef and pork) is esteemed a great delicacy by the natives of the islands and countries near which this animal abounds. Underneath the skin (which is about half an inch in thickness, and is often made into gelatin) is found a layer of adipose tissue, which yields from four to sixteen gallons of oil, according to the size of the dugong. This oil is very palatable, and is acceptable to the most sensitive stomach, and of late has attained somewhat of a reputation as a substitute for cod-liver oil.—L.

The oil is fully as nutritious as cod-liver oil, and may be administered in all forms of tuberculous and wasting diseases, and, with equal advantage, in cases where there is a decided repugnance to the cod-liver oil.—K.

EUPHORBIA HYPERICIFOLIA.

Nat. Ord.—Euphorbiaceæ.

The entire plant Euphorbia hypericifolia (*Linn.*).

Common Name.—Garden spurge.

Euphorbia hypericifolia is a common weed, found in gardens and on cultivated land, in all parts of the United States. The stem is from one to two feet high, ascending, and much branched; it is smooth, and when the plant grows in sunny situations, is of a purple color. The branches are alternate, and proceed from opposite sides of the stem, giving the plant a flat appearance. The leaves are about an inch long, opposite, unequal at the base, and supported on very short leaf-stalks; they are oblong, obtuse, triple-veined from the base, and serrulate, with numerous small, appressed teeth. The larger leaves have large purple spots near the center, which is very characteristic of the plant. The flowers are small, inconspicuous, and appear late in summer. They have the peculiar structure of the genus *Euphorbia*, and the involucrate clusters are borne from the forks of the branches on slender stalks, about a quarter of an inch long. The fruit is a three-lobed carpel, containing three wrinkled, blackish seed. The plant is described in *King's Dispensatory*, but has lately attained such a reputation among Eclectic physicians as to justify further notice. Dr. H. L. True brought it forward in the *E. M. Journal*, 1874, since which time numerous articles have appeared in various medical journals, and, at present, the plant is in regular use among Eclectic physicians. There has been no further analysis or chemical examination.—L.

This plant is highly recommended in diarrhea, dysentery, cholera morbus, and cholera infantum, and to remove gastro-intestinal irritation, and is certainly deserving the attention of medical men. The dose of

a strong infusion of the plant is, for a child, from fifteen minims to two fluidrachms, every hour; for an adult, from a teaspoonful to a tablespoonful every hour. Dose of the Specific Tincture, one or two drops in water, every hour or two.—K.

FIR-LEAF OIL.

Oleum Folii Pini Sylvestris.

This oil is in use throughout various portions of Europe, and is distilled from the leaves of *Pinus Sylvestris*, or "Scotch Pine," which is found in the highlands of Scotland, where it occurs, as tree or shrub, according to the locality of its growth. The oil was admitted to a position in the *Pharmacopœia* of the Throat Hospital, London (1872). It must not be confounded with *oil of turpentine*, which is abundantly produced from the trunk of the same tree. It is said that fir-leaf oil is largely sold in England and on the Continent, as a patent liniment for the cure of rheumatism. In maladies of the throat it may be administered internally, in the dose of a few drops, diluted, and likewise be locally applied to the throat and chest.—L.

FRANKENIA GRANDIFOLIA.

Nat. Ord.—Frankeniaceæ; now known throughout the Eastern United States as the drug "Yerba Reuma." This is a small shrubby plant, with a prostrate, much-branched stem, about six inches long. It is a native of California, and is found in abundance in sandy localities near the coast. The leaves are opposite, entire, obovate, tapering at the base, and ending in a small mucronate point. The flowers are sessile, between the forks of the branches, small, and of a bright-pink color. The calyx is tubular, five-angled, five-toothed, and hairy externally. The petals are five, slightly longer than the calyx and attenuated to slender claws. The stamens are six or seven, and about the length of the petals. The pistil consists of a one-celled, many-seeded ovary, and three slender styles, united for about two-thirds of the way, and stigmatose along the inner surface. This plant is very salty to the taste, leaving an astringent after-taste.—L.

This plant has been lately recommended as a mild astringent, having a favorable action upon diseased mucous membranes, and serviceable in diarrhea, dysentery, vaginal leucorrhea, gonorrhea, gleet, and catarrh. The dose of the fluid extract is from five to twenty-five minims; when diluted with water, it may be applied locally by injection, or spray.—K.

GARCINIA MANGOSTANA.

This is a tree of the *Nat. Ord.* Guttiferæ, found in the Malay Islands. It was grown in the gardens of the Duke of Northumberland in 1855, and produced both blossom and fruit (see illustration in *Bot. Mag. t.*, 1847). The fruit of this tree is the famous *Mangostan* or *Mangosteen*, said to be among the most luscious of tropical fruits. Its rind is about the fourth of an inch in thickness, contains a very astringent juice, and from which, during wet weather, a yellow gum exudes, which is a variety of gamboge. The Chinese use the bark of the tree to produce a black dye, and it is also used in dysentery.—L.

The rind of the fruit is highly recommended for dysentery, and has been extensively employed in India for that disease. A few years ago the rind was introduced into Europe by Gruppe, of Manilla, who pre-

pared an extract which was administered in the Vienna Hospitals, as an astringent, with success in catarrhal conditions of the throat, bladder, urethra, and uterus, etc. The dose of the solid extract is one grain, repeated six or eight times per day, in pill form, or rubbed up with syrup.—K.

GYNOCARDIA ODORATA (*R. Br.*).

This tree belongs to the *Nat. Ord.* Bixineæ, *Tribe* Pangeiæ, and is a very large and handsome East Indian Tree. The leaves are glossy, entire, and alternate; the flowers yellow and sweet-scented. The fruit is round, ash-colored, and, when mature, averages in weight from ten to twenty pounds. The numerous seeds are imbedded in its pulp, and contain an oil, which, according to Roxburgh, is mixed with fresh butter and used by the natives as a remedy for cutaneous diseases. They are known as *Chaulmoogra* (or Chaulmugra), and are said, when powdered, to have been used with advantage in scrofula, skin diseases, and rheumatism; the dose being about six grains.

Chaulmugra Oil is obtained by pressure from the seeds, and of late years has attracted some little attention outside of India where it has long been used. It is said that, in consequence of its high price, it is extensively adulterated by the natives of India, and so adroitly as to cause even the physicians in India to discontinue its use.[1] This oil (*J. Moss*) is granular, melts at 42° C. (107°6 F.); but, after melting, may be reduced much below this point without solidifying, and has, at 42° C., the specific gravity of 0.930. It has an acid reaction, an acrid taste, and a slight scammony-like odor. It is insoluble in water, partly soluble in alcohol and ether, and, excepting impurities, seems to perfectly dissolve in chloroform, carbon disulphide, and benzine. Mr. Moss found it to yield, upon the application of appropriate reagents, *palmitic acid;* a new acid, to which he gave the name, *gynocardic acid; hypogœic acid* (named from the seed of Arachis hypogœa), and *cocinic acid.* Of these four acids *palmitic* constitutes the largest proportion, altogether making eighty-one per cent. the weight of the oil. *Gynocardic acid*, $C_{14}H_{24}O_2$, however (11.7 per cent.), is the important constituent, and which gives the burning taste to the oil. Chaulmoogra oil strikes a green color with sulphuric acid.—L.

Chaulmugra oil is used both internally and externally in leprosy, secondary syphilis, rheumatism, scrofula, and in phthisis. The dose for an infant is one or two drops daily; for an adult, from two to four minims, repeated three times a day. Drachm doses are said to have been given without any unpleasant results. Externally, it has been successfully applied in the above-named diseases, likewise in herpes. tinea, stiffness of joints, ulcers, and various cutaneous eruptions. It is usually triturated with from four to six parts of simple ointment, and thoroughly rubbed in with the palm of the hand, or with the finger's ends. Moss recommends the following formula for its economical use: Take of Chaulmugra Oil two parts, Paraffin Wax, at 106° F., one part, and Ozokerine[2] five parts, and triturate thoroughly together. He also advises, as a more pleasant mode of administration, the use of perles or capsules, each containing the required dose. Children may take it in a little warm milk. Salt meat, sweetmeats, spices acids, and tobacco, are strictly forbidden while taking this oil.—K.

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[1] *New Remedies*, 1879.

[2] Ozokerine is produced from ozokerite or earth-wax, and forms a tasteless and odorless basis for preparing ointments.

MICROMERIA DOUGLASSII (*Benth.*).

Nat. Ord.—Labiatæ; the *Yerba Buena* of California, is a labiate plant of the *Tribe* Satureineæ, closely allied to the common garden thyme (*Thymus vulgaris*). It is a native of California, and has a slender, creeping, perennial stem. The leaves are opposite, nearly round, and are borne on slender stalks. The flowers are small, purple, and in axillary clusters of from one to three.—L.

This plant, it is stated, is not only a febrifuge, but also possesses emmenagogue and anthelmintic properties. It is very probable that its virtues are simply those of a stimulating aromatic and tonic, and that its effects are due to these qualities. It may be employed in decoction, or in doses of from fifteen to ninety minims of the fluid extract.—K.

MIKANIA GUACO (*Willd.*).

Nat. Ord.—Compositæ. This is a South American climbing vine, closely allied to the Eupatoriums. The leaves are supposed, by the natives, to be a remedy for the bites of poisonous serpents, a property which they also attribute to Eupatorium Ayapana. The leaves of *Mikania scandens*, an herbaceous twiner, common to the Eastern United States, probably possess similar properties.—L.

This plant has been employed in scrofula, in certain cutaneous maladies, in chronic rheumatism, in diarrhea, and in cholera-infantum. It has been administered in decoction, in syrup, and in fluid extract; the dose of the latter being from fifteen to sixty minims, three or four times a day. Age impairs the virtues of the plant. Dr. Hancock denies that this is the correct counter-poison, *guaco*, which he states is an Aristolochia.—K.

PISCIDIA ERYTHRINA (*Linn.*).

Nat. Ord.—Leguminosæ. This is a small tree, native of the West Indies, and known as Jamaica Dogwood. It is rarely found in Southern Florida. The flowers are in lateral clusters, appearing in profusion before the leaves. They have a broad, bell-shaped, five-toothed calyx, and a papilionaceous corolla, of a dirty white color tinged with purple. The leaves are unequally pinnate, with entire, oval, acute leaflets, resembling those of the coffee-nut tree. The fruit is a four-winged legume. The bark of the tree is very astringent, and is said to have been used in tanning. It is much employed in its native country as a fish poison (whence the generic name of the tree). It seems to act as a poisonous narcotic. For an illustration of the tree, see Nuttall's *North American Sylva*, *Plate* 52.—L.

Dr. Hamilton (*Burnett's Outlines*, p. 684) states that a tincture of the bark of this tree is, the same as the bark itself, astringent and irritating. He also observes that it is most powerfully and remarkably narcotic and diaphoretic, and that its local application is a specific in removing toothache. We have no positive knowledge as to its therapeutical virtues. It is, undoubtedly, possessed of energetic qualities. The fluid extract has been used in doses of from two to twelve minims.—K.

PLANTAGO DECUMBENS (*Farsk.*).

(*P. Ispaghula*, *Roxb.*) *Spogel, or Ispaghul Seed.*[1]

This little plant is common throughout Northwestern India, Arabia,

[1] For an illustration of this plant, see *New Remedies*, 1878, p. 68. To this journal, and *Pharmacography*, we are mainly indebted for our notice of this plant.—L.

and neighboring countries. The seeds are the part used; they are about one-eighth of an inch in length, and half as broad, concave upon one side, and convex upon the opposite; and, according to the *Pharmacographia*, are so light as to require one hundred to weigh a single grain. Spogel seed have long been employed in India; and, in 1868, were admitted to a position in the *Pharmacopœia* of that country.—L.

Spogel seeds are very mucilaginous, and form a thick jelly with water. They are employed, in India, for treatment of diarrhea and dysentery, either in substance or in decoction. In chronic diarrhea, they are often given whole, in doses of from one to two drachms, mixed with a little syrup, or powdered and mixed with sugar and water. When bruised and moistened with water, the seeds are often used by physicians, in India, as an emollient poultice.—K.

QUILLAYA SAPONARIA.

Nat. Ord.—Rosaceæ. *Common Name.*—Soap-tree.

This tree is a native of Chili, and is known as Cullay, Quillilia, Quillaja, and Soap-tree. The bark is the part employed; it is rough, dark-colored externally, and very tough. It has no odor, but workmen dislike to powder it, in consequence of the irritating properties of the dust. The taste is acrid and disagreeable. Quillaya bark is said to be used in its native country for washing clothes, and removing grease-spots; and in this country it is employed for cleaning delicate ribbons and wool. It depends upon saponin for its value in this respect, foaming when rubbed with water. It is also used by the natives of Chili and Peru for washing the hair, thus: Soap-tree bark, in powder, one hundred parts; Alcohol, four hundred parts; Essence of Bergamot, twenty drops; mix. Saponin is a very energetic sternutatory, and acts as an emeto-cathartic and diuretic.—L.

RHODODENDRON MAXIMUM (*Linn.*).

Nat. Ord.—Ericaceæ; Rose Bay Tree, or Great Laurel, is a tall evergreen shrub, or small tree, found growing along mountainous streams in the eastern section of the United States. The leaves are very thick and leathery, entire, oblong, acute, smooth, and borne on short wrinkled stalks. The flowers appear in midsummer, and are very large and showy, in terminal, umbellate clusters.—L.

This agent was introduced to the profession by Dr. J. M. Mulholland, of Penn., 1877, as a remedy for obstinate cough in elderly persons, in diphtheritic croup, and for the cure of those cutaneous affections in which arsenic is frequently prescribed. In cough, he found it more efficacious, when this was severe without expectoration, and was accompanied with a sweetish or mawkish odor of the breath, and a tremulous pulse. The dose is a teaspoonful every hour, of a mixture of twenty minims of the fluid extract with four fluidounces of water.—K.

SOPHORA JAPONICA.

This is a fine tree, a native of China or Japan. The flowers, under the name *Wai-fa*, or *Wai-hwa*, are used in those countries for dyeing silk a yellow color, and to produce a beautiful green, when mixed with a proper proportion of blue. All parts of the tree are purgative, and persons who prune it, as well as workmen who are engaged in turning the dry wood, are affected by it.

S. Speciosa (*Benth.*) yields a bean which, it is said, is sometimes employed as a medicine by the Indians of Southwestern Texas, producing

delirious exhilaration, and subsequent sleep of two or three days. Not more than half a bean is taken, it being asserted that an entire bean will kill a man. Dr. H. C. Wood prepared, from specimens of the bean, an organic substance, which is, probably, an alkaloid, as it possesses alkaline properties, is insoluble in alkaline solutions, soluble in ether and dilute acids (presumably forming a soluble salt in the latter case). He named it *sophoria.* Of this substance a mere speck paralyzed a frog, and one-twentieth of a grain caused a cat to sleep many hours. From an overdose, death followed in a few hours. Its action is similar to that of calabar bean. It appears to be a spinal sedative, and occasions death through the respiration.—L.

SOYMIDA FEBRIFUGA.

Nat. Ord.—Meliaceæ. This is the *Rohuna* or *Rohún* tree of Hindostan, and is known, on the Coromandel coast of India, as Redwood-tree, and is the only known species of the genus. The bark is very bitter and astringent, and was recommended, by Roxburgh, as a substitute for cinchona; it was admitted into the *Edinburgh Pharmacopœia*, in 1803, and, in 1807, into the *Dublin Pharmacopœia.* It is used as a tonic, and also as an antiperiodic; but, according to Ainsle, if given beyond the extent of four or five drachms in twenty-four hours, will derange the nervous system, and occasion vertigo and subsequent stupor. It is said to have been employed in India with success in treatment of gangrene (?); and in Great Britain, as an astringent, and in the treatment of typhus fever. Waring, who has employed it, considers it to be a bitter tonic, and not a febrifuge.—L.

TYLOPHORA ASTHMATICA,

Or Indian Ipecac, is a twining, shrubby species, a native of the Indian Peninsula, Ceylon, and the Moluccas. The root has long been used by the Hindoos as a medicine; and, in small doses, is cathartic—in large doses, emetic. In consequence of its use as a substitute for ipecac, in India, the plant has acquired the name "Indian Ipecac." It has been successfully employed as a remedy for epidemic dysentery, and has also been recommended in humoral asthma. Kilpatrick reports the administration of the leaves, in a great number of cases, with entire satisfaction. The dose of the powdered leaves, as an emetic, is twenty-five or thirty grains; as a diaphoretic and expectorant, from three to five grains.—L.

UMBELLULARIA CALIFORNICA (*Nutt.*).

This is a large evergreen tree, which is found growing in the mountainous regions of California. It is known by various common names, of which the following have been recorded: Mountain Laurel, California Laurel, California Spice-tree, Sassafras Laurel, Cajeput Tree, and California Olive. There has been some considerable difficulty in determining its precise botanical position, and it has been variously described as Umbellularia Californica, Oreodaphne Californica, Drimophyllum pauciflorum, Tetranthera Californicum, and Laurus regia. The *flowers* appear in April, in lateral clusters, and are of a greenish-yellow color. The *leaves* are alternate, lanceolate, entire, and of a firm texture. They are borne on short leaf-stalks, and end in slender, acuminate points. The fresh or dry leaves are odorless, unless broken or bruised, when they exhale a pungent, aromatic odor, somewhat resembling cajuput oil. They are sharp and biting to the taste, and we find that both the odor

and taste depend upon the presence of a volatile oil, which we obtained, in the proportion of six fluidrachms to the pound of green leaves, by distillation with water. This oil is the characteristic principle, and was previously examined by Mr. John Hearney, of California (*Pacific Med. and Surg. Journ.*, 1875), who obtained four per cent. from the leaves. He states that the exhalation from the fresh tree occasions headache; and this statement is supported by a communication received by us from Dr. L. Mann, although we perceived no ill effects when distilling the oil. The oil has a sharp, biting taste, an odor resembling cajuput and nutmegs, and is of a greenish-straw color.—L.

Dr. L. Mann sent a specimen of this plant to Mr. Curtis Lloyd, who forwarded to him its botanical name, with description. Dr. M. states that it is a valuable remedy in nervous headache, cerebro-spinal meningitis, bilious colic, and atonic diarrhea. According to his experience with it, it certainly demands a careful investigation by medical men. Dose of the fluid extract of the leaf is from five minims to half a fluidrachm, repeated three or four times a day, or as may be required.—K.

XANTHIUM SPINOSUM (*Linn.*).

Nat. Ord.—Compositæ. Xanthium spinosum is a weed known as "spiny clot-burr," and is naturalized in the United States, in many places near the sea-coast, the seed having been introduced in ballast. The *stem* is an annual, from one to three feet high, much branched, and armed with numerous spines. The spines are of a light straw-color, and are divided, about a quarter of an inch from the base, into three slender, sharp, diverging branches. The *leaves* are lanceolate, acute, tapering to a short leaf-stalk at the base; they are entire or have two teeth, or often lobes, near the base. The under surface is covered with a close, white tomentum. The *flowers* are small, monœcious, the sterile being borne near the apex, the fertile at the base, of the branchlets. The *fruit* is a rough oblong burr, armed at the apex with a short beak, and densely covered with equal hooked prickles. In 1876 *Guichart* thought to have discovered an alkaloid in the alcoholic extract, but *Yvon* afterward failed to identify it, and considers the substance to have been a resin, which, in acid solution, precipitates certain reagents for alkaloids.—L.

This plant was recommended as a specific in the treatment of hydrophobia, by Dr. Grzyvala; the assertion being made that in one hundred cases, and upward, of persons who had been bitten by rabid dogs, the administration of this article effected recovery without a single failure. The dose was ten grains of the plant, in powder, repeated several times a day. Experiments by other physicians have failed to sustain this assertion, and the plant has passed into disrepute.—K.

TABLE *of the Elementary Bodies used in Medicine and in Combination; with their Atomic Weights* and Symbols.*

Name.	Symbol.	Atomic Weight.	Name.	Symbol.	Atomic Weight.
Aluminum	Al	27.3	Iron	Fe	55.9
Antimony	Sb	122.0	Lead	Pb	206.4
Arsenic	As	74.9	Lithium	Li	7.01
Barium	Ba	136.8	Magnesium	Mg	23.94
Bismuth	Bi	210.0	Manganese	Mn	54.8
Boron	Bo	11.0	Mercury	Hg	199.8
Bromine	Br	79.75	Nickel	Ni	58.6
Cadmium	Cd	111.6	Nitrogen	N	14.0
Calcium	Ca	39.9	Oxygen	O	15.96
Carbon	C	11.97	Phosphorus	P	30.96
Cerium†	Ce	142.2	Potassium	K	39.04
Chlorine	Cl	35.37	Silver	Ag	107.66
Chromium	Cr	52.4	Silicon	Si	28.0
Copper	Cu	63.0	Sodium	Na	22.99
Gold	Au	196.2	Sulphur	S	31.98
Hydrogen	H	1.0	Tin	Sn	117.8
Iodine	I	126.53	Zinc	Zn	64.9

*Atomic weights after Roscoe and Schorlemmer.

†The atomic weight of Cerium, as given in most Chemistries, is 92, which does not agree with the periodic law of the elements. Mendeljeff proposed to make it 140, but the careful investigation of Burig gives 141.2.—L.

ABBREVIATIONS,

OF THE PRINCIPAL NAMES OF AUTHORS AND OF WORKS REFERRED TO IN THE SUPPLEMENT.

Ait.—Aiton.
Am. Disp.—American Dispensatory.
Am. Journ. Pharm.—American Journal of Pharmacy.
Ann. der Chim.—Liebig's Annales de Chimie et de Physique.
Benth.—Bentham.
Bent. and Tri. Med. Plants; (B. and T. Med. Plants).—Medicinal Plants, by Robert Bentley, F. L. S., and Henry Trimen, M. B., F. L. S.
Bot Mag.—Botanical Magazine.
Bot. Reg.—Botanical Register.
Br. P. and *B. P.*—British Pharmacopœia.
Canad. Pharm. Journ.—Canadian Pharmaceutical Journal.
Chem. Gaz.—Chemical Gazette.
Chem. News.—Chemical News.
Compt. Rend.—Comptes Rendus.
D. C.—De Candolle.
Drug. Circ.—Druggist's Circular and Chemical Gazette.
E. M. Journal.—Eclectic Medical Journal (Cincinnati).
Ell.—Elliott.
Engl.—Engelmann.
F. v. M. and *F. Muell.*—Ferdinand von Mueller.
Gært.—Gærtner.
Hook.—W. J. Hooker.
Hook. and Arn.—Hooker and Arnott.
Hook, fil. (filius)—J. D. Hooker.
Hook. Flora Bor. Am.—Hooker's Flora Boreali Americana.
Jacq.—Jacquin.
Journ. Chem. Soc.—Journal of the Chemical Society (London).
Journ. de Chim. Med.—Journal de Chimie Medicale de Pharmacie et de Toxicologie.
Journ. de Pharm.—Journal de Pharmacie et de Chimie.
K.—King.
L.—Lloyd.
Lag.—Lagasca.
Lam.—Lamarck.
L'Her.—L'Heritier.
Linn.—Linnæus.
Lind—Lindley.
Mich'x.—Michaux.
Mich'x Sylv.—Michaux's North American Sylva.

Mill.—Miller.
N. Y. Med. Journ.—New York Medical Journal.
Nat. Ord.—Natural Order.
New Rem.—New Remedies (Wm. Wood & Co.).
Nutt.—Nuttall.
Org. Const. of Plants.—Organic Constituents of Plants (Wittstein).
Pharm. Journ. and Trans.—Pharmaceutical Journal and Transactions (British).
Phil. Trans.—Philosophical Transactions.
R. Br.—Robert Brown.
R. and S.—Roscoe and Schorlemmer's Treatise on Chemistry.
Roxb.—Roxburgh.
Strong's Am. Flora.—Strong's American Flora.
Sub Ord.—Sub Order.
Syn.—Synonym.
U. S. P.—Pharmacopœia of the United States.
Var.—Variety.
Walt.—Walter.
Willde.—Willdenow.
Wood. Med. Bot.—Woodville's Medical Botany.

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Oxymurin.

BY

G. H. MERKEL, M. D., A. C. M., BOSTON.

The agent known as Oxymurin is a solution of chloric, chlorous, and hypochlorous acids, in accordance with the following formula: 1-2 (Cl. 2 O.), 2 (Cl. 2 O. 2), 15 (H. Cl. O. 3), 1000 (H. O.).

Its properties are antiseptic, prophylactic, febrifuge and disinfectant.

It has been employed in Europe with great success for the various disorders of a putrid, malarious, or contagious character, arising from the putrefactive disorganization of the blood: Yellow Fever, Typhus, Typhoid, Intermittent, Remittent, etc.; Small-Pox, Diphtheria, Scarlatina, Variola, Measles, Erysipelas, and the other Exanthemata; Cholera, Dysentery, and the various Choleraic diseases. It is also applied externally with great advantage in gargles, injections, etc., and for open Ulcers, Cancer, Syphilis, Scrofulous and Erysipelatous Sores, and poisonous bites of insects and animals.

It is not a nostrum or disreputable proprietary remedy, but a scientific preparation, prepared by chemical manipulation; and is approved and used in regular practice by the best physicians of Germany.

Mode of Exhibition.

In cases of where there is a high febrile or inflammatory condition, or in Yellow Fever, Typhus or Typhoid Fevers, Scarlatina, Diphtheria, Croup, Small-Pox, Cholera or Dysentery, a half teaspoonful of Oxymurin is put into a goblet of water, and the patient allowed to drink freely. As many as six tumblerfulls may be thus used daily with great advantage, on account of its strong oxydizing properties.

Acting directly on the decomposing elements of the blood, it neutralizes their virulent character, arrests fermentation, destroys germs and bacteria, heals internal ulcerations, facilitates digestion, and thereby promotes rapid recovery. It aussages fever and inflammation more speedily than chlorine-water, hydrochloric acid, potassium chlorate, etc.

In Diphtheria the affected surfaces are painted with Oxymurin undiluted. A gargle is also used composed of one part of Oxymurin to five of water. As the disorder is mitigated the proportion of water may be doubled.

Oxymurin thus diluted may be successfully employed as a lavement in Cholera, Dysentery, and other intestinal diseases, and for sponging in eruptive disorders, as Small-Pox, Scarlet Fever, Measles, Roseola, etc.

As an internal remedy in Diphtheria and Indigestion, Oxymurin is superior in its action to the more common remedies, hydrochloric acid, sodium bicarbonate, etc. It is the best addition that can be made to impure and unwholesome drinking water.

During hot weather, Oxymurin may be used as a beverage, putting a teaspoonful in a tumbler of water. It is far preferable to soda, acidiluted waters, lemonade, and other fruit preparations, as it never occasions irritation of the bowels, or diarrhœa; neither does it constipate the bowels.

As an external application in Cancerous, Syphilitic, Scrofulous, and the various suppurative Ulcers, Oxymurin, applied without dilution, will be found to be a most energetic agent to cleanse the parts, destroy and neutralize the peculiar secretions, and promote healing action.

There is not the least occasion for fear or apprehension from any deleterious or poisonous property, as is the case with many other agents used for similar purposes, such as carbolic acid, iodoform, etc.